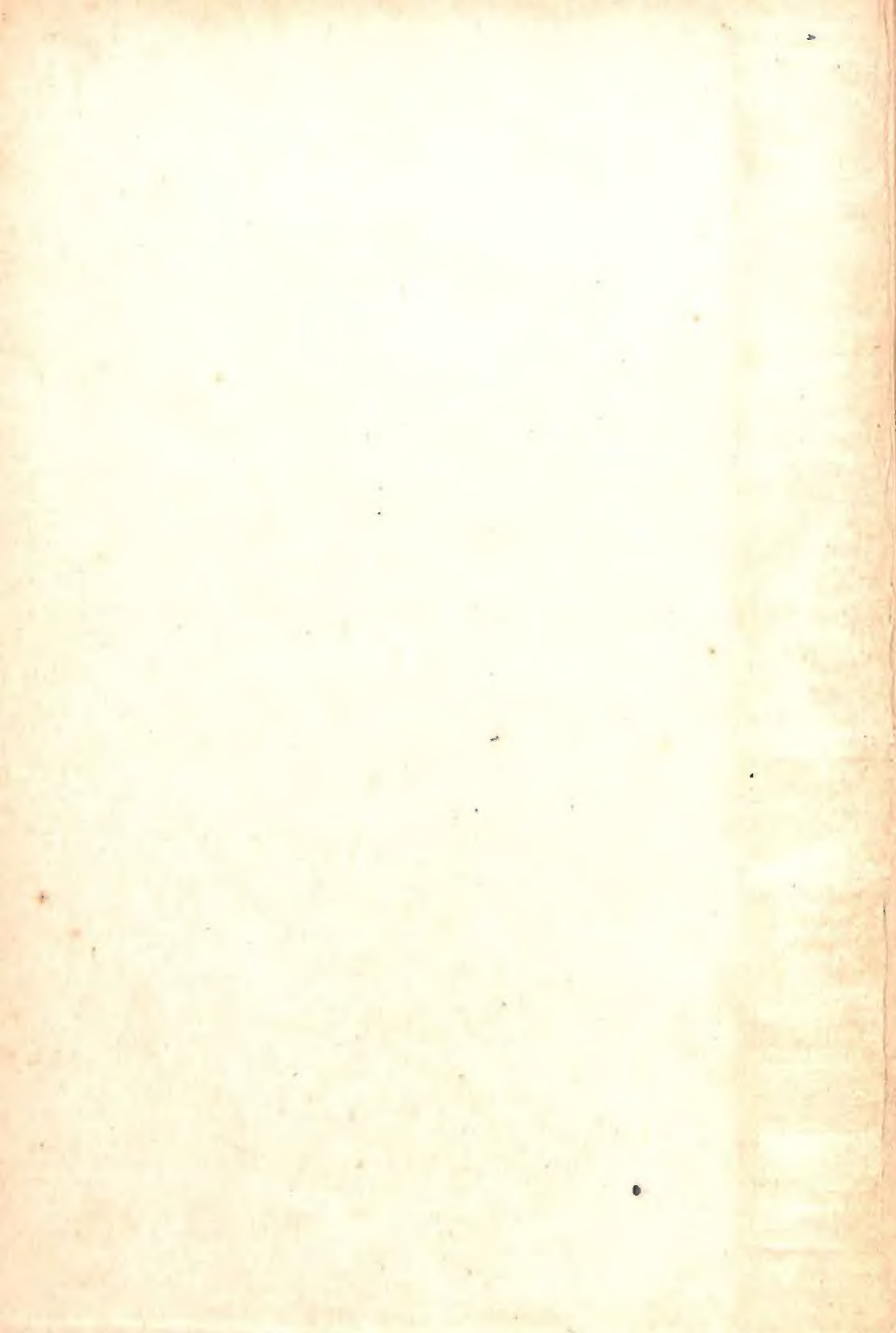


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Professional
Problems
in Psychology

DANIEL and LOUTTIT



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Professional Problems
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Professional Problems in Psychology

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Date.....
Acc. No.....

New York PRENTICE-HALL, INC. 1953

S.C.E.R.T., West Bengal

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DAVID HARE TRAINING COLLEGE	
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Acc. No	382

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Preface

In preparing this book, we had in mind the needs of the graduate student in working toward a professional status in psychology and also the continuing needs of the psychologist actively engaged in one or more of the many divisions of our science. The professional psychologist will find it most useful as a reference book, and the graduate student will find it organized in such a manner as to permit use as a textbook. Certain parts of the book will be informative for the undergraduate who is considering psychology as a career.

The three areas covered in the major sections of this book—literature search, scientific reports, and professionalization—include knowledgeable material and skills which the student is expected to master. Unfortunately our graduate schools heretofore have provided little in the form of guided instruction in these problems. To be sure, the typical graduate student learns some of these things incidentally in carrying on his academic and research programs, but such incidental learning frequently results in some inefficient habits at best; seldom are the skills learned when first needed.

Although the successes and failures coming from direct experiences in the student's attempts at professional-like activities are of undoubted value, the initial efforts of reading, writing, and socialization into a career can lead to more efficient learning and certainly can be more rewarding if a comprehensive source of information and guidance is provided. In short, these are tool skills deserving the same attention we give to the teaching of such skills as research design, test administration, apparatus construction, statistical analysis, and others traditionally included in the graduate program.

For the psychologist beyond his professional degree this volume will serve as a ready reference to a variety of professional activities. Our experience indicates that psychologists' familiarity with the

problems we discuss is often incomplete, distorted, and evidently acquired in a casual fashion. As a reference work this book will serve to organize such casual knowledge. It will also be of value to reference librarians and others who have need of an information source concerning the profession of psychology.

Part IV of this book should have special mention. The attention we have given to professionalization should promote an increased awareness of responsibility by the individual psychologist toward the professional group. The process of calling attention to these duties from time to time is usually necessary in any democratic group and helps to maintain those objectives for which it stands. Many of the problems discussed in the chapters of Part IV can be solved only by more thinking, discussion, and action by a greater proportion of the professional group. We have not offered proposals for solutions to those problems, but instead we have presented the historical facts and the issues involved. Our objective is to encourage the student to consider problems of psychologists as he is learning to master content problems in psychology.

This book has been in preparation for a considerably longer time than the writing has been in process. Louttit's work in the bibliography of psychology began in 1928 when he published his *Bibliography of Bibliographies in Psychology*. Daniel first became interested in these problems when he was a student in Louttit's seminar in Psychological Literature at Indiana University in 1939. More recently Louttit has become editor of *Psychological Abstracts*, and, since 1947, Daniel has taught a course for graduate students in psychology at the University of Missouri entitled "Studies in Professional Problems." From these courses and experiences have evolved the basic outline and much of the content which follows this preface.

It is hardly possible for us to assign credit or responsibility for the various chapters by authorship. Originally a work plan was agreed upon which assigned about half of the chapters to each author. By the time the final manuscript was finished, whole sections—indeed whole chapters—had been so thoroughly rewritten as a result of our mutual criticality that the final result must be a shared responsibility. We both contributed to Appendix A; Louttit assembled Appendix B; Daniel assembled Appendices C and D.

We must call attention to the method of reference to citations

which we have used. The parenthetical reference item number in the text, familiar to most readers, has been employed for citations found at the end of each chapter. When reference is made to an item in one of the appendices, its appropriate number is preceded by a letter designating in which appendix the item will be found. Thus, reference to the APA *Directory* is (A 133) which indicates that it is item number 133 in Appendix A.

ROBERT S. DANIEL
C. M. LOUTTIT



Acknowledgments

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The authors also wish to thank Laurance F. Shaffer for his material on rejection of manuscripts submitted to the *Journal of Consulting Psychology* and J. McV. Hunt for the table on rejection reasons for articles submitted to the *Journal of Abnormal and Social Psychology*. Finally they wish to acknowledge with thanks the assistance given in data collection by the students in Daniel's "Studies in Professional Problems" course in 1949 for the study on journal interrela-

tionships and the study repeating Guest's investigation of attitudes toward psychologists; the students in 1950 for the study on the coverage of the *Psychological Abstracts*; the students in 1951 for the study on the sources of research funds in psychology; and to all the students in that course in the period 1947-1953 who have contributed by their criticality, appreciation, and enthusiasm.

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PART I

Introduction



CHAPTER 1

An Orientation in the Profession of Psychology

Every fall hundreds of students enter graduate schools to begin advanced professional education in psychology. Each one of these students has been admitted only after careful selection. If we pick any student at random, it is very probable that we will find he has made a fine record in a first-rate liberal arts college with a good background in the sciences, social sciences, and mathematics. He has had excellent recommendations from responsible persons who know him well. He has, perhaps, also demonstrated outstanding skill at passing tests selected by the staff with which he now begins more serious study. In short, he is known as a typical bright graduate student.

This book is, first of all, for each one of these young graduate students. Its purpose is to aid him in the four-year (plus or minus one year) metamorphosis from student to professional. He will find it to be a book less about psychology than about psychologists; not concerned with the understanding of behavior, but rather with problems of persons who go about the business of attempting a scientific understanding of human behavior; not, to be sure, all of their problems as human beings, but more particularly those problems encountered in their peculiar and oftentimes frustrating efforts of enquiry.

Graduate training for our student of psychology is planned, quite properly, to emphasize the scientific nature of the field. He will find that great importance is placed upon familiarization with experimental design, statistical analyses, theory construction, behavior laws, psychodiagnosis, psychotherapy, psychophysics, and psychodynamics. In his years as a neophyte psychologist he comes to have an intimate familiarity with color shock, test validity, sign-gestalt,

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latin squares, reverberating circuits, sampling theory, the ego, growth curves, retroactive inhibition, RT, MMPI, sHr, GSR, and all the rest of it. We hope, too, that he acquires the wisdom to select and integrate, analyze and comprehend, understand as well as know psychology.

The graduate psychology department is a good one. The staff is well trained and broad in interests. The physical facilities are good. The morale of the graduate group is high; interpersonal stimulation and healthy competition add immensely to each student's own efforts. The curriculum has been designed and redesigned in the past few years to ensure that he should receive adequate training in the content of the science, in research methods, and possibly in the techniques of one of the applied fields.

Yet some phases of scientific training are often neglected. Curiously enough, they represent the beginning phase, the terminal phase, and what we should like to call the consequence phase of research effort. To initiate a piece of research efficiently, our student must know how to conduct a literature search. To complete the research, he must report it adequately to others. In doing so he becomes a member of a group, identifying himself with them and sharing common problems. Too long it has been assumed that a student comes into graduate training after having previously mastered these skills somewhere or that they will be sufficiently assimilated during his training. To be sure, he has had some contact with them. For the typical or even the superior student this means poorly remembered elementary knowledge of library usage and expository writing plus a vague notion that professional people "have ethics" and "belong to an association." It is also true that he will pick up many of the bits of information he needs as he goes along. This is a peculiarly slipshod way of effecting training in such important skills as these.

These problems are common to training in all sciences. Lonsdale has clearly stated the wishes of many other teachers of young scientists in an editorial appearing in the British journal *Research* (the italics are ours):

I would rather have a student who thinks logically, *who knows how to use a library efficiently, who has studied good writing and can express himself clearly, concisely, and stylishly on paper*, who has a working knowledge of mathematical technique and of two or three

foreign languages, and who has facility with tools, than one who has dropped everything . . . to concentrate on two or three subjects [in his earlier training] (4, p. 439).

We view these three areas—literature search, scientific reporting, and professionalization—as professional problems of the graduate student and as continuing needs of the professional. The neophyte first encounters them in the process of learning the content and methods of the science. These three needs are not of psychology but of psychologists. These are not problems directly related to content but rather to the accumulation of content, to the consequences of that accumulation, and to the welfare of those who do the accumulating. All of this surely bears sharply upon the efficiency, accuracy, and value of the development of laws of human behavior. Its neglect will be reflected in slower progress, emphasis upon it will be reflected in a stronger science.

In this first chapter we wish to define further and to document the need for greater attention to the professional problems of the young psychologist. In the following sections and chapters, the purpose is to supply discussions, reference material, and suggestions for further pursuit of aids toward growing into the profession of psychology.

NEEDED AREAS IN PROFESSIONAL TRAINING

Efficient Literature Search. The student preparing a class report, the M.A. candidate structuring a thesis problem, and the established researcher share the common task of library investigation into the existing knowledge of the chosen subject. Mastery of the tools not only contributes to efficiency of productive and scholarly output, but is a skill providing direct satisfaction to the urge for discovery. However unpromising any bibliographic tool may seem, if it uncovers just one citation which proves vital to the development of a hypothesis, the clarification of a puzzling point, or even perhaps the interpretation of one's data, then hours of inspection are justified. Full coverage of a topic is the objective. For self-instruction, if not for publication, a *complete* bibliography of the subject under investigation should be a reality very early in the progress of any study.

That many writers of books or journal articles do not reach such an objective is abundantly clear. Notice any journal which carries extensive book reviews. One of the most telling criticisms often

pointed out there is the omission of discussion of, or reference to, certain studies which the reviewer, himself a specialist in the subject, considers to be highly significant. Journal articles, too, frequently reveal embarrassing gaps in their coverage of the pertinent literature. In one of our most widely read journals, the lead sentence of a recent paper reads as follows (with the name deleted): "In 1939 X reported a study which showed . . . , although we were not aware of this when we reported a similar study in 1942." Both articles referred to in this quotation appeared *in the same journal*. Many more writers have committed this type of bibliographic failure than are willing to correct the error as did this psychologist.

Most graduate departments have had a student commence a thesis study only to discover its counterpart reported in an obscure (or sometimes not so obscure) journal. There is much support for the statement that we do less experimental repetition and verification in psychology than we should, but no one is likely to argue that the student should commence a thesis without a thorough digging into the literature. This position has been defended in an editorial in *Endeavour*, which states:

The first task of a scientist entering a field of research is to master the facts already discovered by earlier workers and then to keep abreast of the discoveries of his contemporaries pursuing the same line. In theory, this process is very simple; in practice, the barriers between the research worker and the facts are often so formidable as seriously to impede the progress of science. In many fields, the accumulation of earlier work and the output of new publications are so great that research in the laboratory is outweighed by that in the library. Even the most conscientious reader frequently finds that he has missed papers which would have filled essential gaps in his knowledge, and awareness of which would have saved weeks or months of laboratory work. . . .

It is important that the research worker keep abreast of developments in fields other than his own, the writer continues, because (a) borderline and cross-science journals are carrying specialized articles of considerable significance, and (b) problems in one field of science are often solved by methods developed in another.

The fact that science is in danger of suffering from its own weight is apparent to many, but it is not yet so widely recognized as its seriousness demands, although in recent years it has been the subject of very wide discussion. . . . Certain useful steps . . . have been

taken to ease the burden on the research worker. Most notable is the publication of journals of abstracts, the helpfulness of which is too obvious to need emphasis; yet journals of abstracts have inherent disadvantages which make it impossible for them to give the ordinary research worker a complete guide to existing knowledge in his own particular field.

Abstracts are too brief and appear after too long a delay, it is argued. Classification is dictated by "the main stream of scientific progress" while "many individual research workers are trying to work their way across the current." Other solutions to the problem involve the professional literature searcher, who never approaches the problem in quite the same way as the scientist, and the development of microfilm and other copying techniques. Such aid, however, gives no assistance in the *discovery* of helpful papers. The editorial continues:

In spite of all that has been done to help him, the average research worker, unless he happens to be able to make full use of a well-endowed library large enough to offer some of the special services described above, is still very largely dependent on his own efforts, and on the service provided by the abstracting journals. . . . No rapid alteration in the situation is to be foreseen. Accordingly it is perhaps appropriate to suggest one way—too widely neglected—in which the scientist, especially the younger scientist, can be taught to help himself more effectively. This is by the inclusion, at an early state in the university science course, of detailed instruction in the use of the science library. . . . To track down information speedily and successfully requires both a wide general knowledge of the bibliography of science and a knowledge of modern library practice. . . . The really essential thing is to know where to find information quickly when it is needed. . . . The scientist who can make the best possible use of whatever library facilities he possesses gains so great an advantage that the matter is too important to be left to chance. *Every student of science should be specifically instructed in the bibliography of science* [italics ours] (3).

Effective Scientific Reporting. Few people are gifted with the ability to master, retain, and assimilate the abstract content of science without the reinforcement which comes through writing. We refer here to every kind of scientific writing from rough note-taking to the erudite theoretical treatise. The advanced undergraduate or beginning graduate student must formalize his scientific writing in term paper, laboratory report, and examination paper. The M.A. candidate must present his research in the written form of a thesis.

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The advanced graduate student encounters even more complex forms of written scientific communication as he ventures into his first "public appearance" in print. Then follows the dissertation and, it is hoped, a career including productive contributions to the literature of the science.

Oral communication is also demanded of the scientist. From classroom recitation through seminar reports, occasional (and later regular) lectures, presentation of papers at meetings, and other events, the psychologist encounters the need for skilled public speaking. The student in preparation for teaching, and to only a slightly lesser degree the applied and research psychologist, discovers that much of his success depends upon ability to "put across" ideas clearly, effectively, and persuasively.

Lonsdale, in a commentary in *Research*, points out the scientist's needs for communications skills:

. . . The specialist must be able to write down the results of his experiments clearly and intelligibly; he will probably also be called upon to explain them to audiences of non-scientists or of scientists in other fields. He must develop a good style, and it is unlikely that he will be able to do this unless he studies masterpieces of good writing, and listens to good speakers himself. It is to be regretted that this is so seldom realized, . . . that otherwise good students are often unable to write down logically and concisely what they have done and what they deduce from their observations. Even experienced research workers sometimes seem to imagine that they must wrap up their investigations in long sentences and words that none but their colleagues can understand (4, p. 439).

Every scientific report is for the purpose of effective communication of descriptions and ideas with *someone*—the writer himself, a limited number of other persons, or a public. No scientific effort, be it survey, rumination, exploration, observation, investigation, or integration, is complete until it has been recorded and communicated. The final and perhaps the most important step in any scientific investigation is the preparation of the results for contemporaries, and through archives to future scientists.

As in all sciences, the research productivity of the psychologist would have little value and would be meagerly rewarding if it were not known beyond the institution of its origin. From the reports of research in our literature we grow professionally and contribute our share to the pool of recorded knowledge. A scientific communication

is the culmination of the research project; it informs the profession of the worker's effort, his method of investigation, and his success in finding a solution to his problem. Further, if properly prepared, it permits reproduction of the investigation for purposes of verification and extension by others. These are significant functions of publication for scientific advancement of psychology.

For the research worker who publishes his reports there are also personal values. Training and practice in the preparation of comprehensible articles can reasonably be expected to show transfer to the orderly planning and execution of future research. The motivation value is clearly not the most insignificant of functions served. "Getting into print" as an author and researcher carries a certain prestige value. The author of a scientifically respectable article is stimulated by the satisfaction of having made a worthwhile contribution. His eventual gain is less nebulous, for he has made an investment in professional advancement. A personal bibliography of sound scientific publication is very good insurance indeed for promotion and general improvement of professional status. At the termination of a graduate student career (or even before) the search for an appointment is supported considerably by the addition of reprints or bibliography to one's credentials. Following publication, the reinforcement value of having one's articles favorably cited by others has as yet unmeasured but doubtless considerable power in furthering one's efforts. Use of a personal bibliography is accepted as an ethical, if not the only ethical, method of self-promotion among the research professions. These are significant functions of publication for advancement of the scientist in psychology.

Before we leave the topic of personal values, it is appropriate to temper our remarks of the preceding paragraph with a word of caution. The reader should note especially the qualifying terms in the expressions "scientifically respectable," "worthwhile contribution," "sound scientific publications," and "favorably cited." We should like to add our protest to that of Clark (1), who has spoken with considerable force against the practice of professional advancement on the basis of publication *quantity* alone.

It would seem that the advice to prepare a research report as carefully as one would prepare a research design scarcely requires argument. And yet too many good scientists are not good reporters. The very high rejection rate of articles submitted to journals today

—in many journals exceeding 50 per cent—reflects many factors, including inferior research skill and inferior research reporting. Unfortunately an editor cannot always distinguish the latter deficiency from the former, but when he can do so the result is an unfair demand upon his time or else tedious revision by the author. Every journal editor collects his share of atrocious manuscripts, an even larger number which are just bad, and altogether too few characterized by clarity of style and accuracy of form. Not always have editors screened manuscripts as carefully as in recent years; probably no editor has a record of continuously good screening. Consequently one can find some pretty horrible examples in the published literature. Sumner, a prolific abstracter of psychological articles, mildly complains that he must “read and abstract the basic idea from written compositions which range in quality from crystal-clear, goal-directed, concrete expression all the way to what might be well described as a species of free association.” “Goal-orientation,” he writes, “is much rarer than one might suppose” (5).

It is our aim to help the student and the professional to improve scientific communication, to avoid the “species of free association,” and to achieve “goal-directed” reporting.

Familiarization with the Profession. The psychologist, who has done so much to study other occupations and who has contributed considerably to their progress, should profit likewise from a thorough knowledge of his own group. This study properly begins, not with the awarding of the professional degree, but earlier—during his graduate training. Neither possession of the diploma nor membership in the American Psychological Association guarantees that a psychologist will assume the responsibilities, accept the duties, or profit from the values identified with the professional worker. He needs to be trained in these aspects of his lifework just as truly as he needs training in its methods and content. With such instruction, he shifts easily and effectively from student to full-time professional worker.

In order to gain a better perspective of the science for which he is preparing, the graduate student can profit from the study of a number of its professional aspects. He will appreciate its progress and its failures if he is aware of the history and intellectual culture which created them. This should include, for fullest gain, history of the profession as well as history of its thought and discovery. He

will make a wiser choice of a specialty within the science if he acquaints himself with the many "kinds" of psychologists—what they do, whom they work for and with, their prospects and limitations—all this in relation to his own interest patterns, aptitudes, and temperament. He can identify himself with his science even as a graduate student if he knows about the organizations psychologists have formed for themselves and especially if he takes advantage of what they offer him. Psychologists of every variety are becoming more and more concerned with their own acceptance by one or more publics. Who constitute these publics? What is their attitude toward the psychologist? How can it be improved? What profit will accrue to the psychologist and those publics through such improvements? Questions such as these suggest legitimate and important professional problems for study by the graduate student as well as by the professional.

The student should be expected to become more effective in the service aspects of psychology if he is well versed in such related problems as ethics, relations with other professions, his legal status as a psychologist, and the public's knowledge of his services. If he chooses teaching as a career, he cannot avoid sooner or later making decisions on curriculum construction (graduate and undergraduate), selection of those applicants suitable for advanced training, and other problems. Very soon, often before completing his graduate degree, he will have the responsibility of planning and teaching an elementary class. He will want to ask himself questions about the role of psychology in the college or university—its place in the educational scheme, its opportunities for service within the institution. If a research career is his choice, he needs information about agencies which will support his research, what research is marketable, how to prepare reports for consumption, and the like.

Many psychologists in recent years have remarked publicly about the progress of their science in terms of the growth process. Some have placed mid-century psychology in the adolescent period, others at postadolescence or young maturity. In every case it is recognized as having developed rapidly in professional stature and prestige during and since the war years of 1940–1945. Perhaps the reorganization of the American Psychological Association, completed in 1945, is the best landmark for the coming to maturity of the science professionally. With this change has certainly come an official recognition

of the need to study ourselves as professional people. Various committees of the national society and, less formally, many of the state societies have initiated programs of careful evaluation, assessment, and the cautious derivation of recommendations. As one example of the trend, the following statement from Dennis illustrates the growing recognition of the need for study in this area:

I believe it eminently proper that we should be deeply concerned with our own professional problems. To be occupied with such matters need not mean that we are ingrown bores or that we suffer from an occupational introversion. We must keep in mind that we are a very special group, having a very special function. We represent the science of human behavior, the art of management of human relations. We are expected to excel in the solution of human problems. If we cannot succeed in solving our own professional problems, we will be as suspect as would be a group of ophthalmologists who had not corrected their own errors of refraction. Since we cannot solve our own problems unless we direct our own attention to them, the first task is to ask ourselves what are the problems which need solutions (2, p. 3).

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CHAPTER 2

The Development of the Modern Profession of Psychology

Psychology as a science is a relatively young field. As Brett's monumental history (6) clearly shows, philosophers since Plato and Aristotle have discussed problems of sensation, perception, thinking, and behavior, all of which would today be considered proper subjects for scientific investigation. But it was not until late in the nineteenth century that empirical and experimental investigation of these same problems started, and the separation of psychology as a science from its earlier history in philosophy began. Insofar as a specific date can identify this beginning, it is 1860, when Fechner's *Elemente der Psychophysik* was published. It must be remembered, however, that this book was written by a physicist-philosopher, that it was at least in part a result of earlier work of the physiologist E. H. Weber, and that it was the only major work in psychology by its author. At the same time a considerably younger physiologist was turning his attention to a similar problem—in fact had published two years earlier the first section of a work which was completed in 1862, entitled *Beiträge zur Theorie der Sinneswahrnehmung*. This author was Wilhelm Wundt (1832–1920), who had taken his doctorate in medicine at Heidelberg in 1856 and had stayed there with an appointment in physiology. In the *Beiträge* he spoke of “experimentelle Psychologie” and during the four years of its writing his psychological interests widened. They continued to do so for the next 60 years. The importance of Wundt to modern psychology cannot be overemphasized. The volume of his writings,¹ the many

¹ Boring (4, p. 345) calculates 53,735 pages in the 491 items of Wundt's bibliography, and points out that simple computation will reduce this to an estimated one word every two minutes for the 68 years between 1853 and 1920—and these are 24-hour days!

students who studied with him, and of greatest importance his experimental, theoretical, and systematizing works mark him as perhaps the most influential person in the beginnings and growth of experimental psychology.

Important as Wundt is, many of his contemporaries in several countries also made significant contributions to the base upon which the psychology of today rests. To select only major examples from Britt's excellent list (7), mention may be made of von Helmholtz, Mach, Brentano, Stumpf, Ebbinghaus, and G. E. Muller in Germany; Bain, Galton, Sully, Ward, and Romanes in England; and Charcot, Ribot, and Richet in France. It is not our object to review the history of psychology, however briefly, but these limited remarks will show that the last half of the nineteenth century was a period of increasing activity in the new science. The last two decades of the century in particular show an almost spectacular growth evidenced in many ways.

Although the sources of present-day psychology are to be found in the early work of Europeans, and although the contributions to the science from European laboratories and clinics during the past half century are of acknowledged importance, the purpose of this book demands that limits be imposed. These limits are in content and geography. Our concern is with such aspects as personnel, publications, and training rather than the history of theories, concepts, and experiments. Secondly, our discussion will, in large measure, be limited to psychology in America. Such a limitation is justified for our purposes because the scientific and applied aspects of psychology have grown at a significantly greater rate in America than they have elsewhere. Speaking of psychology in 1950, Boring (5) says: "Psychology has prospered and expanded. It has, for the most part, crossed the Atlantic to America."

As Wundt stands out as the foremost figure in the history of experimental psychology, so William James (1842-1910) holds a similar prominence in the history of psychology in America. Ten years younger than Wundt, James was his contemporary. Although not an active experimentalist himself, and although he did not accept uncritically the "new psychology" from Germany, James used the results of experiments reinterpreted in his own "functional" systematization. His *Principles of Psychology* was started in 1878 but not completed for twelve years. It was immediately acclaimed. The

1880's were a decade of laborious work for James in the writing of his classic and of growing activity in the field of psychology. The 1890's saw an acceleration of the pace. Without attempting to set too specific dates, it appears reasonable to say that the modern science of psychology in America has a history of some sixty years, starting around the beginning of the last decade of the nineteenth century.

Psychology was being taught in American colleges earlier than 1880. Davis (14) surmises that the appearance of American psychology textbooks early in the nineteenth century "suggests that it was introduced as a special study in the colleges between 1800 and 1830." A casual inspection of college catalogues of this period and later indicates that "mental philosophy" or "intellectual philosophy" occurs with great frequency. In 1883-1884, Brown University required of seniors a course in intellectual philosophy in which Wayland's *Intellectual Philosophy* and Porter's *Human Intellect* were used. The next year, Sully's *Outline of Psychology* was added. Eight years later, in 1891-1892, psychology appeared under that name with the following assurance: "Psychology is taught from the experimental rather than from the natural point of view, but by means of rigorous drill in logic the course in these two studies is made to afford a mental discipline no less severe than that of the former course in Intellectual Philosophy" [1] (9, p. 75).

The Amherst College catalogue for 1884-1885 first describes the course in psychology thus: "Psychology is at first taken up as an experimental science, the actual facts of experience furnishing the data. These are studied until a classified system of all the powers and activities of the human mind is attained. This gives an open door to a universal philosophy which is considered in itself and in some of its more important and profound applications to science, to art, to morality, and to religion" (1, pp. 24-25).

In 1870-1871, Cornell University offered "Lectures on the physiology of the nervous system and comparative psychology, with special reference to the phenomena of psychology as manifested in the human consciousness" (13). These are examples of the types of psychology courses found listed in college catalogues in the transition period. Together with an increasing number of colleges offering psychology as a distinct subject (usually in the department of philosophy), the 1880's show also an increasing introduction of

"experimental" psychology, reflecting the growing science in Germany.

The first psychological laboratory is usually attributed to Wundt in 1879, but a recent study by Harper (23) presents cogent arguments that James's laboratory at Harvard in 1875 should have priority or at least share the primacy with the first effort of Wundt the same year. In the 1880's, laboratories were started, according to Garvey (22), at Hopkins, 1883-1884, Pennsylvania, 1887, Indiana, January 1888, Wisconsin, September 1888, Clark, McLean Asylum (Somerville, Mass.), and Nebraska, 1889. During this same decade, Ladd's *Elements of Physiological Psychology* (1887) and Baldwin's *Handbook of Psychology: Senses and Intellect* (1889) were published. In 1881, Ochorovicz of the Université Polonaise de Lemberg proposed that an International Congress be held, but it was not until 1889 that the First International Congress was held at Paris. Two hundred members from all European countries attended and at least James and Jastrow came from the United States (12). Finally, American journal literature in psychology began in this decade with the *American Journal of Psychology* in 1887. The decade of 1880 was a transition period between the intellectual philosophy of the earlier nineteenth century and the "new psychology" and its expansion during the 1890's and the twentieth century.

The growth of psychology in America, especially during the twentieth century, has been rapid. It has been marked by theoretical proposals, by additions to methodology, and by a broadening of the fields of interest of investigators. We cannot trace this development in detail, but some impression may be gained by considering the increase in personnel, the history of journal publishing, and the changes in training in colleges.

PERSONNEL

In contrast with the number of persons in certain fields such as medicine or chemistry, the approximately 10,000 professional psychologists of 1952 appear as a small group. However, when compared with the number of psychologists barely 60 years ago, the increase is spectacular. The best available data on the number of professional psychologists is provided by membership in the American Psychological Association. Table 1 presents the membership of this Association for each year since its founding in 1892, and in

Figure 1 the membership for each fifth year is plotted, with separate indication of the two classes of membership established in 1926.

TABLE 1

Membership in the American Psychological Association, 1892 to 1953

<i>Year</i>	<i>Number</i>	<i>Year</i>	<i>Number</i>	<i>Year</i>	<i>Number</i>
1892	31	1904	148	1916	308
1893	42	1905	162	1917	336
1894	53	1906	181	1918	337
1895	62	1907	197	1919	372
1896	74	1908	209	1920	393
1897	87	1909	221	1921	424
1898	101	1910	228	1922	442
1899	113	1911	241	1923	457
1900	127	1912	262	1924	464
1901	127	1913	272	1925	471
1902	127	1914	285		
1903	135	1915	295		

<i>Year</i>	<i>Fellows*</i>	<i>Asso- ciates</i>	<i>Total</i>	<i>Year</i>	<i>Fellows*</i>	<i>Asso- ciates</i>	<i>Total</i>
1926	494	41	535	1940	664	2,075	2,739
1927	516	92	608	1941	683	2,254	2,937
1928	534	165	699	1942	713	2,518	3,231
1929	540	353	893	1943	760	2,716	3,476
1930	530	571	1,101	1944	858	2,948	3,806
1931	530	737	1,267	1945	1,012	3,161	4,173
1932	525	985	1,510	1946	1,083	3,344	4,427
1933	535	1,135	1,670	1947	1,078	3,583	4,661
1934	530	1,224	1,754	1948	1,281	3,766	5,047
1935	542	1,276	1,818	1949	1,436	5,299	6,735
1936	556	1,431	1,987	1950	1,498	5,775	7,273
1937	587	1,551	2,138	1951	1,575	6,979	8,554
1938	603	1,715	2,318	1952†	1,621	8,261	9,882
1939	618	1,909	2,527	1953†	1,621	9,465	11,086

* Beginning in 1926 there were two classes of membership. Members and Associates; with the reorganization in 1945 the classes of membership were named Fellows and Associates.

† 1952 and 1953 figures are unofficial.

On July 8, 1892, at least ten persons met at Clark University at the invitation of G. Stanley Hall to discuss the problems of starting an organization of psychologists. Dennis and Boring (16) in a careful review of the evidence believe that ten persons were almost certainly at this preliminary meeting. In addition to Hall these were George S. Fullerton, who presided; William L. Bryan, B. I. Gilman,

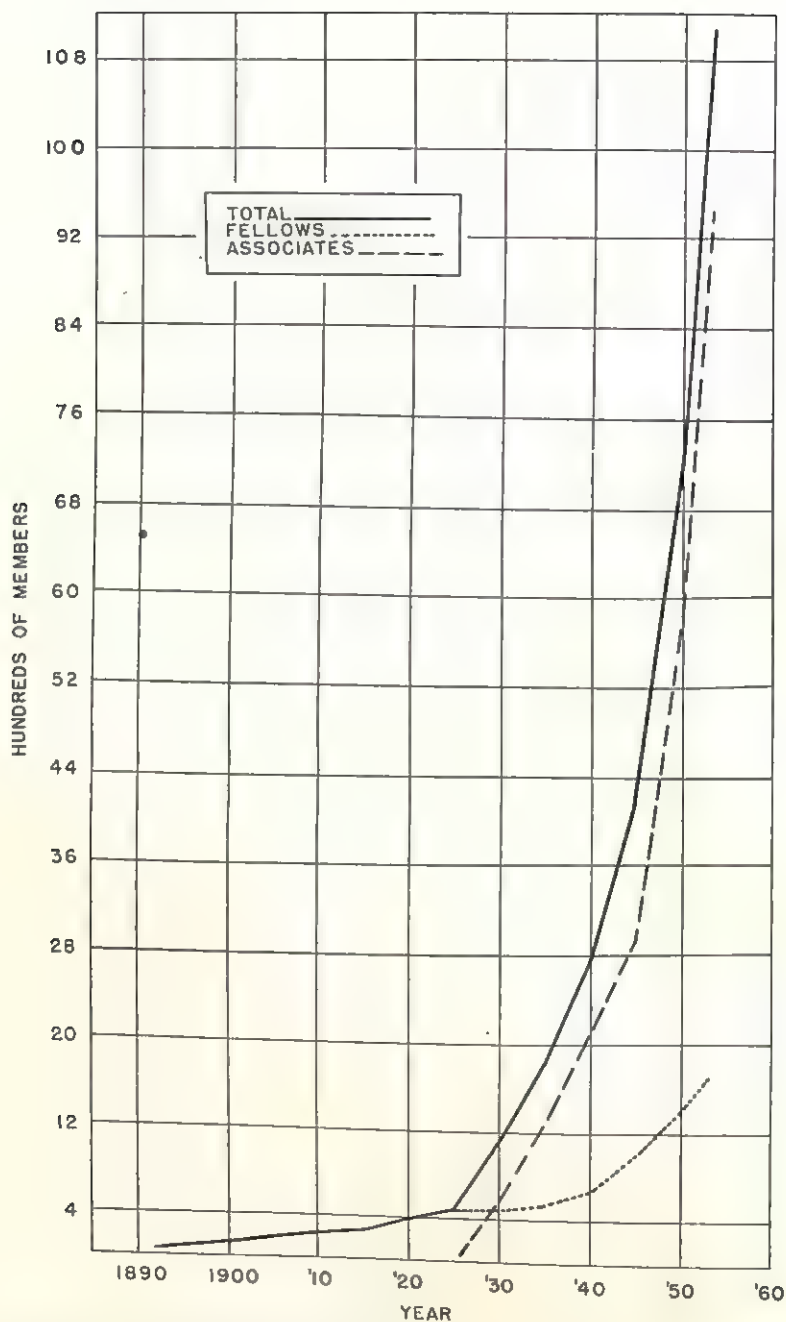


FIGURE 1. *Membership growth of the American Psychological Association, 1892-1953.*

Joseph Jastrow, W. O. Krohn, H. Nichols, and E. C. Sanford, each of whom read a paper; and W. H. Burnham and E. H. Griffin, who were members of the Clark University staff. In addition these authors believe that very probably E. B. Delabarre from Brown, and E. Cowles and W. Noyes from McLean Hospital were also present. Although this list does not agree with that given by Fernberger (17, 19), it appears that it is compiled from carefully evaluated evidence. In addition to these 13, there were 13 additional charter members, who were probably not at the preliminary meeting. Thus the details of the very beginnings of the Association are in doubt, but it is certain that the group planned a First Annual Meeting for December 27, 1892, which was held at the University of Pennsylvania. The list of 31 members for 1892 was "a very heterogeneous collection indeed, containing psychologists, educators, philosophers, and physicians." Following these remarks, Fernberger (17) opines that it is doubtful if more than 20 of the group could have been elected to full membership in the Association in 1930!

The group of 31 in 1892 increased by nine the next year and by 1900 had quadrupled. Growth was slow but steady until in 1925 there were 471 members. The following year, a significant policy change established a category of "Associates," of whom 41 were elected in 1926. Since that year, the growth in total membership has been extremely rapid. As is evident from the curves of Figure 1, the rapid increase is most closely paralleled by the increase in Associates. Members (later called Fellows) continued to increase for a number of years at approximately the same rate as since the beginning. During World War II, between 1940 and 1945, the rate accelerated and has continued to do so.

Although membership data of the APA present an excellent picture of the increase in the number of professional psychologists, the question may be asked if this membership includes all psychologists in this country. Unfortunately the word "psychologist" cannot be patented or copyrighted, nor does it have any legal reservations such as are enjoyed in some states by "doctor," "physician," or "surgeon." Therefore the number of people who call themselves or "psychologists"—and who even list themselves as such in telephone directories—is legion. However, certain studies made during the 1940's indicate that an appreciable number of persons with training and experience of a professional type are not members of the

Association. Marquis (27), in reporting a survey made by the Office of Psychological Personnel of the National Research Council, indicated that of the 4,553 psychologists registered, from whom data were obtained, only 3,806, or 83 per cent, were members of the APA. A few years later, Britt and Morgan (8), in a questionnaire study of psychologists who were or had been engaged in war activities, found that 31 per cent of the 968 who completed returns were not members of the Association. Similar percentages were reported by Longstaff *et al.* (25) and Speer (30) in studies of employed psychologists in four midwestern states. From Illinois alone, Speer found 672 persons employed as psychologists of whom only 381, or 57 per cent, were members of the APA, although 101 others were affiliated with state or regional associations. The percentage of non-members was unusually high in this report, probably because of the careful search to locate persons who were employed as psychologists regardless of how that term was defined by the employing agency. In the larger, four-state study (of which the Illinois data were a part), 28 per cent of the 1,293 individuals included were not members of the Association. Because of the almost certain inclusion of the same names in all or several of these studies, and because of the different criteria of "psychologist" used, it is not possible to combine these data into a single figure. However, it seems reasonable to believe that only about 75 per cent of persons who consider themselves, and/or who are considered by their employers, as psychologists belong to the Association.

That this ratio is not something peculiar to the last decade is suggested by an early study of Cattell (10). In preparation of his order-of-merit rating of scientists later indicated by stars in *American Men of Science*, Cattell reports that in 1903 there were 313 persons whom he considered to have made significant contributions to psychology. Only 200 were selected as actively engaged in psychology or in this field combined with education or philosophy. If we compare this number with the 135 reported membership of the APA for that year, we find that 33 per cent were not members. The surprisingly close agreement between data gathered 40 years apart suggests that an appreciable number of psychologists do not affiliate with the major national society. How many of these who are not members are not eligible for membership is unknown. Nevertheless, the data available suggest that growth figures for the

APA are sufficient to indicate trends, but not to establish the absolute number of psychologists. The membership figure should be multiplied by a factor of approximately 1.3 to give an indication of the total number of psychologists.

Together with the increase in numbers of psychologists there has been a change in the pattern of activities in which they are engaged. Of the original 31 members of the APA, only two were not members of a college or university faculty. Expressed percentage-wise, 93 per cent of the first membership list were in teaching positions. In 1916, 24 years later, this percentage had dropped to 76. As will be seen in Table 2, the next 24 years saw a decrease to

TABLE 2

Per Cent of APA Membership in Teaching and Non-teaching Positions

	1892	1916*	1931†	1940†	1948‡	1951§
APA membership	31	308	1,267	2,739	5,047	8,554
Teaching positions	93.5	75.7	61.5	50.1	39.1	32.4
Non-teaching positions	6.5	7.8	22.1	32.0	50.9	57.7
Non-psychological positions	—	16.5	16.3	17.8	9.8	9.9

Subdivisions of non-teaching positions

Clinical	3.2	7.5	9.9	19.3
School	1.6	2.6	5.3	7.5
Guidance and personnel . . . . .	.3	1.4	5.6	11.4
Industrial	0.0	1.9	2.1	6.0
Consulting . . . . .	.3	2.4	3.0	2.8
Research	2.2	6.1	5.9	3.8

* Finch and O'doroff (20)

† Finch and O'doroff (21)

‡ Percentage from sample of 316 entries from the 1948 APA Directory made by recording the first entry from the outermost column of each page

§ Computed from data reported by Sanford (29)

50, and following World War II, the percentage was only 39. The value of psychology in the everyday affairs of the world has been increasingly recognized, not by psychologists alone but by other professions and by business, government, and other social institutions. As a result an increasing number of persons trained as psychologists have used their professional knowledge and skills in dealing with problems other than those of the classroom.

Within the group of psychologists in non-teaching positions, the specialties also show change. The non-teaching members of the

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original group were Wm. Noyes and E. Cowles of the McLean Hospital; they might be thought of as being in the clinical area, although this specialty was not to be started until four years later by Witmer. The clinical area has shown the most prominent growth, with the specialty of guidance and personnel work being second. The changes in these and other major divisions of psychological application are shown in Table 2. The gross categories used conceal the postwar specialized application to problems of engineering design of instruments and controls, to problems of intergroup tensions, to propaganda and its analysis, to problems of communication, and to a number of other areas that give promise of demanding an increasing number of psychologists for decades to come.

PUBLICATION

When we think of the literature of psychology today, we think first of the hundreds of articles in journals devoted to psychology and to a score of related subjects. This is equally true for other sciences and scholarly fields. However, the journal as a medium of communicating the results of research or the theoretical products of thought is relatively new. The *Philosophical Transactions* of the Royal Society, started in 1665 and continuing to the present, was the first of thousands of journals. Together with the *Journal des Sçavans* in France and *Acta Philosophica* in England, both started in 1665, it is the parent of periodicals in this field. It is impossible for us to trace the history of periodicals during the next three centuries; by the early nineteenth century, general review journals had achieved an established place and their number increased. Journals for special interests began to appear and by the 1880's they were increasing at an accelerated rate as scientists and scholars demanded a more prompt and convenient method of recording their discoveries.

In the field of psychology five journals appeared in the eighteenth or very early nineteenth century. All of these were published in Germany—*Repertorium Psychologie und Physiologie nach ihrem Umfange und ihre Verbindung* (1786–1788), *Magazin zur Erfahrungs-Seelenkunde* (1783–1793), which was continued in the *Psychologisches Magazin* (1796–1798), and *Allgemeines Repertorium für empirische Psychologie* (1792–1801), which was continued as *Neues allgemeines Repertorium etc.* (1802–1803). Through the kindness of Alice I. Bryan, we have the titles of papers in the first

three volumes of the *Psychologisches Magazin*, which are in the Columbia University Library. These volumes were edited by Carl Christian Erhard Schmid, Professor of Philosophy. The articles were: Volume I—Psychological theory of the art of painting; On the perfectibility of the human race; An investigation of materialism; Characteristics of love; On the first psychological investigations of the Greeks, especially Plato and Aristotle. Volume II—Ideas on the common characteristics of mankind with a retrospective look at pathognomy; Something about memory; Shortening and sharpening of the emotions towards those we love; Physiognomy as set forth by Aristotle among the Greeks; History of a hypochondriac. Volume III—On the causes of the frequent lack in practical power of judgment of so-called great geniuses; History of hypochondria; On the relationship of empirical psychology to metaphysics; The rationale of the learning of the soul; A setting forth of the metaphysics of the inner nature; A universal overview of Gemuth's empirical system of learning.

In Appendix B we present a bibliography of 331 journals in psychology. Louttit (26) previously published a list of 1,004 titles of journals in psychology and related fields. For the present work it was decided to condense the list and to include only journals which could be considered primarily psychological. The majority of these titles were found by checking the second edition of the *Union List of Serials* and its first supplement. Titles were added from the records of the *Psychological Abstracts* office and from Bolton (3). For titles from Bolton's list which do not appear in the *Union List* there is no indication that files are available in the United States or Canada. Although files of every journal have not been examined, it is considered that this list is exhaustive and exclusive; it represents a very large proportion of all journals which are of technical importance in psychology itself. There has been no attempt to include journals in psychiatry, education, philosophy, or more remote cognate fields. In addition to its usefulness as a bibliography 326 titles from this list provided the basic data for an analysis of the history and trends of journal publication.

There are 30 countries in which psychological journals have been published, in 16 different languages. A glance at Tables 3 and 4 indicates that the United States and Germany lead in the number of journals; in fact they account for over one-half of all journals

TABLE 3

Country of Publication of Listed Journals

<i>Country</i>	<i>Number</i>	<i>Country</i>	<i>Number</i>
United States	97	Japan	6
Germany	80	Austria	5
France	26	Poland	5
England	17	Sweden	5
Russia	16	Australia	4
China	9	Canada	4
Argentina	8	Spain	4
Netherlands	8	India	3
Italy	7	Romania	3
Switzerland	7	Denmark	2

Belgium, Brazil, Czechoslovakia, Egypt, Mexico, New Zealand, Norway, Peru, Uruguay, Yugoslavia: 1 each

TABLE 4

Languages Used in Listed Journals

<i>Language</i>	<i>Number</i>	<i>Language</i>	<i>Number</i>
English	127	Dutch	8
German	91	Scandinavian	7
French	28	Italian	7
Russian	16	Japanese	6*
Spanish	15	Polish	5
Chinese	9*	Romanian	3

Arabic, Czech, Slovene, Portuguese: 1 each

*The proportion of articles in these journals actually printed in Chinese or Japanese and the proportion in other languages cannot be determined from information available.

in the list. Only three additional countries—France, England, and Russia—have as many as ten journals in the 100-year period. The majority of titles from other countries are found in the 1930's and 1940's. From the point of view of language, English, German, and French, in this order, are most important. These three languages account for 247 of the 326 titles in the analysis.

Duration of Journal Publication. It is evident that not all these journals continued publication for long periods. In fact, as of 1950, 57 per cent of the total were known to have ceased publication, 33 per cent were, from all information available, still being published, and the publishing history of the remainder was in doubt. Of the journals listed as being published in 1950, 34 per cent were started in 1945 or later, and 55 per cent were started in 1935 or later. Only

8 per cent had started before 1900, of which five were American, two French, one English, and one Canadian. The *American Journal of Psychology* has had the longest continuous life.

Table 5 presents the data on the net increase in number of jour-

TABLE 5
Journals Started and Stopped, and Net Change by Five-year Intervals

	Total			United States			Germany			All Others		
	Start	Stop	Net	Start	Stop	Net	Start	Stop	Net	Start	Stop	Net
1850-54.....	1	1	0				1	1	0			
1855-59.....												
1860-64.....	2		2				2		2			
1865-69.....												
1870-74.....	1		3							1		1
1875-79.....	2	1	4							2	1	2
1880-84.....	1	2	3							1	2	1
1885-89.....	6	1	8	1		1	1	1		5	0	6
1890-94.....	14	6	16	6	1	6	4	2	3	4	3	7
1895-99.....	15	3	28	3	0	9	5	1	7	7	2	12
1900-04.....	25	5	48	9	1	17	9	2	14	7	2	17
1905-09.....	22	12	58	7	5	19	8	6	16	7	1	23
1910-14.....	29	17	70	8	2	25	12	6	22	9	9	23
1915-19.....	10	14	66	5	6	24	5	4	23	0	4	19
1920-24.....	29	21	74	5	8	21	8	7	24	16	6	29
1925-29.....	39	18	95	9	4	26	13	3	34	17	11	35
1930-34.....	28	35	88	10	4	32	4	17	21	14	14	35
1935-39.....	28	24	92	13	10	35	3	7	17	12	7	40
1940-44.....	17	14	95	8	4	39	0	8	9	9	2	47
1945-49.....	36	6	125	14	4	49	0	0	9	22	2	67
1950-.....	3		128	1		50	0	0	9	2		69

nals as well as the birth and death by half-decade intervals. Before 1885 there were few journals, but by the last half of the 1880's the psychological activities of that decade are reflected in the increase in number of journals from three to eight. Since that time there has been a steady increase in number. The period of World War I, 1915-1919, showed a small decrease, as did the depression years, 1930-1935. World War II did not effect a decrease, but the net increase was small.

The length of life of journals which have ceased publication averages only slightly over ten years. In Table 6 the distribution of life period in five-year intervals is shown. The distribution is much skewed, with the mode being in the group of one to four years and

TABLE 6

Number and Percentage of Journals Stopped: By Five-year Intervals

Life in Years	Number of Journals Stopped				Percentage of Total Started			
	United States	Ger- many	All Others	Total	United States	Ger- many	All Others	Total
1-4	21	26	37	84	22	33	25	26
5-9	11	11	16	38	11	13	11	12
10-14	6	11	4	21	6	13	3	7
15-19	1	5	2	8	1	6	1	2
20-24	5	5	1	11	5	6	0.5	3
25-29	2	4	2	8	2	5	1	2
30-34	1	5	3	9	1	6	2	3
35-39		1		1		1		0.3
40-44	2	1		3	2	1		0.9
45-49		1	1	2		1	0.5	0.6
Total Stopped...	49	70	66	185	50	85	44	57
Total Started...	97	80	148	325				
Total Continued	48	2	57	107				
History in Doubt	0	8	25	33				

the median just above five years. Journal editing and publishing is expensive in time and money. Apparently there has been a continuing demand for publication media, but this demand has not been matched with financial or other support.

The increase in number of journals is reflected in the number of items—books, pamphlets, journal articles—appearing each year. Two journals which together give a continuous record of psychological literature since 1894 are the *Psychological Index* and *Psychological Abstracts*. Quite possibly the record in these journals is not complete but the percentage of total publications recorded is certainly high. The total number of entries for each year is plotted in Figure 2. Between 1927 and 1935 there are curves for both journals. Annual variations are due in large measure to the exigencies of publishing, but the general increasing trend reflects the growth in the literature of the science. Major drops in number of entries are evident at three points. Beginning in 1913, there is a decrease to a low in 1918—this is the period of World War I. The curve rises steadily to 1931, after which there is a drop of several hundred titles, and this lower level persists throughout the period of depression until 1937. Immediately a new decrease begins, ending in 1945 at

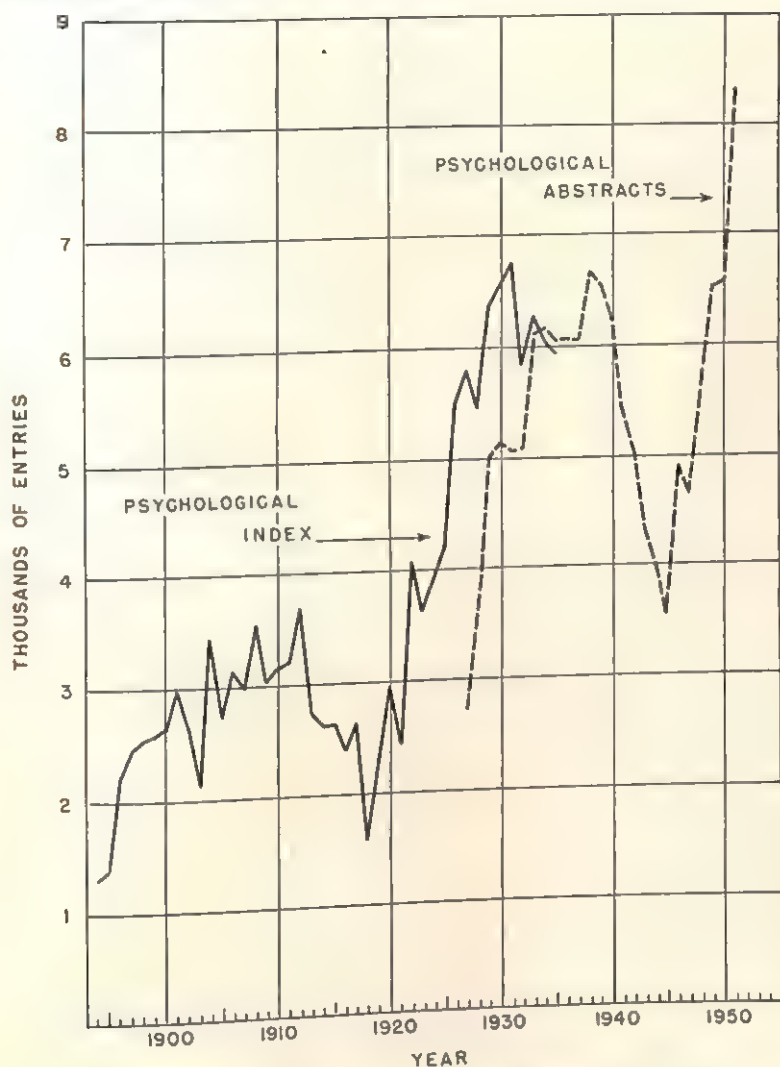


FIGURE 2. Annual number of titles in the psychological literature.

a point lower than any year since 1921. This drop reflects the conditions of World War II. In the five years following the war, the number of entries again increased to the magnitude of 1938.

The languages in which articles abstracted have appeared also show interesting trends. Fernberger (18) has published curves showing the number of titles listed in the *Index* and *Abstracts* for

three-year periods between 1894 and 1935. The first four columns of Table 7 show percentages based on numbers of entries as esti-

TABLE 7

Percentage of Entries in *Psychological Index* and *Psychological Abstracts* Appearing in Different Languages

	1899*	1909*	1919*	1929*	1939†	1949†
English.....	30	30	64	47	57	84
German.....	31	48	20	31	24	4
French.....	30	17	7	7	8	5
Italian.....	8	4	7	6	1	‡
Russian.....				9	2	1
Spanish-Portuguese.....					1	3
All others.....	‡	‡	‡	‡	7	2

* Estimated from Fernberger's curve (18)

† Sample from *Psychological Abstracts*

‡ Less than 1 per cent

mated from Fernberger's curves for entries in several languages irrespective of the country of origin. In each case the year shown is the final one of a group of three used in Fernberger's analysis. The last two columns show the percentage for the same languages based on a sampling from the volumes of *Psychological Abstracts* for 1939 and 1949, in each case including slightly more than 5 per cent of the entries chosen by counting the first entry on the top of each page of the volume. These figures show a decline in the importance of Germany after 1929 and a serious drop following World War II. The proportion of papers in English was high in the World War I period, showed a decrease a decade later, but since then has steadily increased; since 1909, English has been more used than any other language.

TRAINING FACILITIES

As one views the status of psychology as a subject in American colleges and examines the course offerings in psychology departments, one finds an endless variety of details, emphases, and course patterns. To attempt an enumeration would be unprofitable, but certain major trends can be pointed out. Earlier in this chapter we have quoted course descriptions from college catalogues of the 1870's to the 1890's. Before 1880, psychology was a subject taught under the heading "mental philosophy." This, of course, was not

peculiar to America; it reflected the nature of psychological interest as shown in the publications of all European countries. Psychology was a branch of philosophy dealing with mental phenomena as observed in oneself or as inferred primarily from the language expression of others.

The end of the philosophical period cannot be set by day or even year. Wundt in the later 1870's started the change and by 1890 the "new" experimental psychology was well established. Within a decade "mental philosophy" had been eliminated from the curriculum, existed because of an extremely conservative cultural lag, or was a mere title which no one had got around to changing. The major interest of the new psychology was in the human consciousness or mind and its method was mostly introspection.

For many the content of psychology was limited to the adult human mind, but some saw other possibilities. In a prophetic speech at the St. Louis Exposition in 1904, J. M. Baldwin (2) argued that "the position that the private psychic point of view is the only valid one is to grow more and more obsolete among workers in this field. It will no longer be possible to claim that all truth about mind must be traced in some individual's consciousness and that the laws of the science are to be those of observable psychic continuity alone." Further, he proposed that "the genetic point of view will be worked out in a method of research by which genetic science will take its place beside quantitative science: psychology will become largely genetic or functional." And finally, "The psychology of the future will be social to the core; and its results, we surmise, will be revolutionary in logic, sociology, ethics, esthetics, and religion. . . ." And this was being said at a conference in which social psychology appeared not in the section on psychology but in that for sociology.

Regardless of the parallel developments—personal psyche, genetic and social, physiological, and the rest—the point on which all agreed was the importance of experiment. Cattell (11), nearly fifty years ago, expressed himself against a terminological confusion which still persists when he said: "I consequently object to making experimental psychology a branch of psychology. It is a method in psychology, which is extended just as rapidly as psychology becomes a science." The method required a new approach in the teaching of psychology and in its investigational techniques. The laboratory

became the mark of the "new psychology" and of the progressive department.

We have mentioned earlier the eight laboratories started in the 1880's. Writing in 1892, Krohn (24) says that 15 laboratories had been founded "since the autumn of 1888—*within four years.*" He describes 17 departments, indicating the courses taught and the laboratory facilities. Three years later, Delabarre (15) could describe 27 laboratories. The growth was rapid. From Garvey's list (22) we find that each decade had an increased number of laboratories starting: 1 in the 1870's, 8 in the 1880's, 26 in the 1890's, 29 in the 1900's, and between 1910 and 1928 an additional 36. Today a psychology department in even the smallest college without a few pieces of apparatus and without students working with the statistics of test scores or experimental data is almost unthinkable.

From the vantage point of fifty-odd years, the introduction and acceptance of experimental psychology appears to have been abrupt and swift. During the past decade or two there has been another change in the nature of psychological interest which to our colleagues of 2,000 A.D. and the twenty-first century may well appear as abrupt and revolutionary as the changes of the last decades of the nineteenth century seem to us. We are now too close to appraise the changes, and they do not appear so revolutionary. Clinical, social, educational, and industrial psychology, psychometrics, personality study, and similar interests which attract the psychologist of today will be the source of new concepts, new methods, and ultimately a newly integrated "new" psychology. These interests have not arisen overnight; their course may be traced to the work of individuals even as early as the days of the "new experimental psychology." The real growth and the real impetus, however, followed World War I. All these specialties are experimental in the sense that Cattell used the word in the quotation given previously. Experiment as a method is the *sine qua non* of modern psychology; the subject content to which the method is applied is enlarging.

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PART II

Psychological Literature



CHAPTER 3

A Survey of Psychological Literature

How large is the literature of psychology? The answer to this question is not readily found, nor can it be determined with any degree of precision unless we first rigidly delimit the confines of the science. There will be many who hold, and with good reason, that such a building of fences is neither possible nor desirable. It is therefore the purpose of this chapter to survey the literature sources, primary and secondary, which psychologists may profitably use. This will be followed in Chapter 4 by a detailed account of the techniques of searching primary publication.

The psychologist's problems in the field of literature searching are intricate and extensive. In some fields, such as chemistry, the problem is one of *volume*. In psychology it is one of *scattering*. This, of course, merely reflects the nature of our basic datum—behavior. We are interested in any data proving of value, regardless of source. There is probably no scientific discipline with as many ramifications into other fields as we find in psychology.

A study by Daniel (3) provides data in support of this statement. In this study Daniel analyzed the 5,384 citations to journal articles used in all original studies in the 1948 volumes of 19 "core" journals in psychology. The proportions of citations to journals in several other fields are shown in Table 8 in comparison with similar data in physics and chemistry as reported by Fussler (4) for 1946.

It is apparent that although the three fields differ but little in their dependence on their own contributions, physics and chemistry are slightly dependent on each other and "go afield" only to make use of the general science journals. An exception is chemistry's use of biological journals. Citations in the general science field do not ordinarily indicate a different subject matter. Not only does psychology make substantial use of the areas listed, but the last two

TABLE 8

Comparison of Psychology, Physics, and Chemistry in Literature Citations from Other Fields

Field Cited	Proportion of Citation Yield		
	Psychology	Physics	Chemistry
	%	%	%
Psychology.....	70.4	—	—
Biological science.....	13.2	—	6.7
Education.....	5.2	—	—
General science.....	2.8	23.4	11.0
Social science.....	2.6	—	—
Physics.....	1.4	72.7	7.7
Chemistry.....	.5	2.2	72.8
Other fields.....	2.5	.9	.9
Miscellaneous.....	1.4	.8	.9

categories indicate both a broader sampling and more use than the comparable figures for physics and chemistry. In a later section the analytical breakdown of the data for psychology will be presented.

Psychology's traditional alliance with its forebear, philosophy, has been all but completely severed in the United States. Several lines of evidence point to this, notably the fact that philosophy furnished only one half of one per cent of psychology's citation needs in 1948. The pattern is different in European psychology. The lack of world-wide agreement about the nature of the science further distinguishes psychology from its sister sciences and makes its literature problems somewhat more complex. Walter S. Hunter, longtime editor of *Psychological Abstracts*, states the problem in this way:

... it had been my duty for many years to secure brief summaries of psychological material published throughout the world. I was aided in this enterprise by a board of associate editors whose responsibility it was to select the material to be abstracted in their respective national literatures. Now it was almost universally true that their conception of psychology was narrower than mine, although I represented not so much my own personal views as what I understood to be the general American attitude toward the limits of psychology. Thus, much that I regarded as psychology was thought of in other countries as biology, physiology, biophysics, medicine, and engineering, or as sociology. And much that was classified as psychology in those lands, I often regarded as philosophy. Such differences of opinion, if they exist on a large scale, do not make for a strong international status of the science and even

affect its status relative to other sciences in any one country (5, p. 40).

The pattern of relationships shown by citations which psychologists actually use in their productive work is, of course, not the only way one might study the place of psychology among the sciences, but it is an objective and pragmatic verification of Hunter's view of citation sources.

The problem of literature scattering within the library is a familiar one to psychologists. Few university libraries house all psychology titles in a physically limited area. Where branch or divisional library organization is practiced, the difficulties resulting are especially annoying. The dispersion of physical location is merely a reflection of the typical library classification system, which is discussed in Chapter 5. When a library head was once asked by a psychologist if something could be done to bring psychology titles together, she replied in a friendly but firm tone, "You shouldn't be in a field producing things so much desired by so many different branches of knowledge unless you are willing to share that material." The answer to this is not obvious, so perhaps we must recognize the disadvantages of an unclearly delimited science. On the other hand, it may be this very characteristic which gives to psychology much of its vitality.

With these considerations in mind, we return to the original inquiry—what is the extent of the psychological literature? Our best answer will be in terms of the number of citations which bibliographers of psychology have indicated as being of probable interest to the profession. An extensive sampling tabulation of Rand's *Bibliography* (A 117) indicates that by 1894 some 6,763 titles had accumulated. The total of the *Psychological Index* listings from its inception (1894) to its demise (1935) is 150,800 items. From 1936 through 1950 the *Psychological Abstracts* carried 82,265 titles. Up to the mid-twentieth century, then, the psychological literature as defined here had grown to about 240,000 titles. The cumulated curve of literature growth for the period 1850–1950, shown in Figure 3, emphasizes the very rapid rate of growth in recent years. At present there is no indication of a leveling off of productivity.

There is a second consideration more significant than the matter of mere size. It is the contention of Bradford (2) that the interrela-

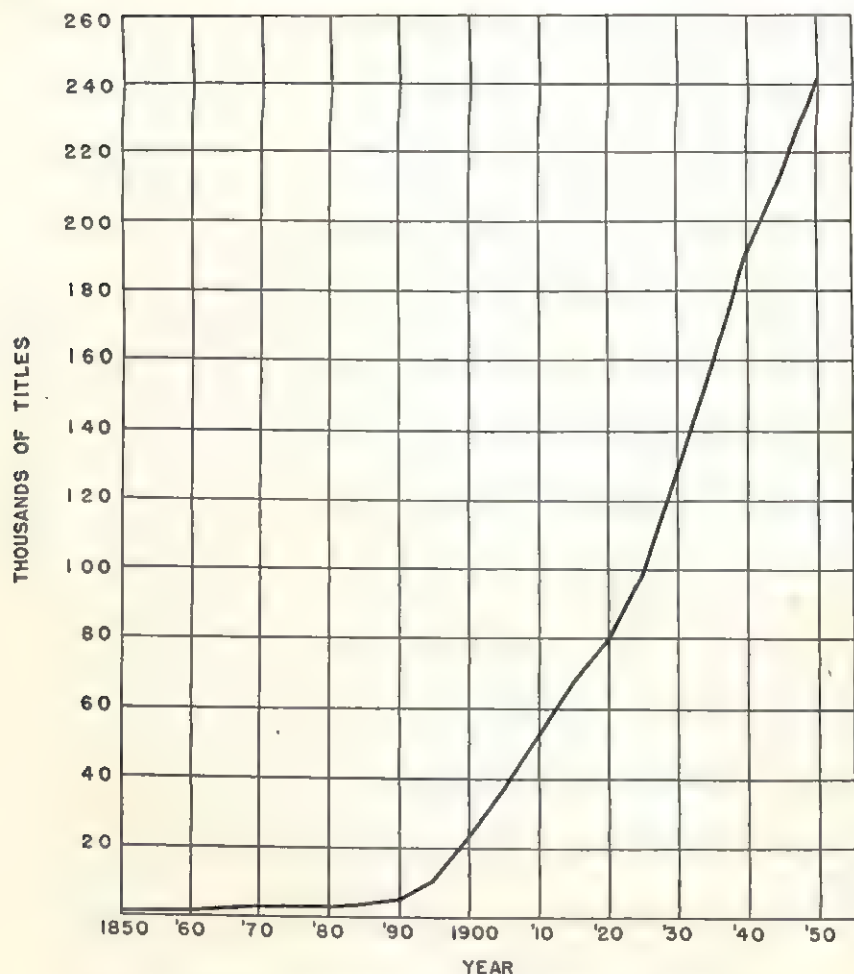


FIGURE 3. Growth curve of psychological literature, 1850-1950.

tionships of all science may be revealed through citation kinship. For any scientific subject there is a "primary zone" of a relatively few publications, each furnishing a great many pertinent references. Beyond this immediate family of periodicals one must consider ever-increasing numbers of journals in order to obtain equivalent numbers of citations. The exact relationship found by Bradford is a logarithmic one for the vast number of citations beyond the primary zone, when a two-, three-, or four-year citation demand is consid-

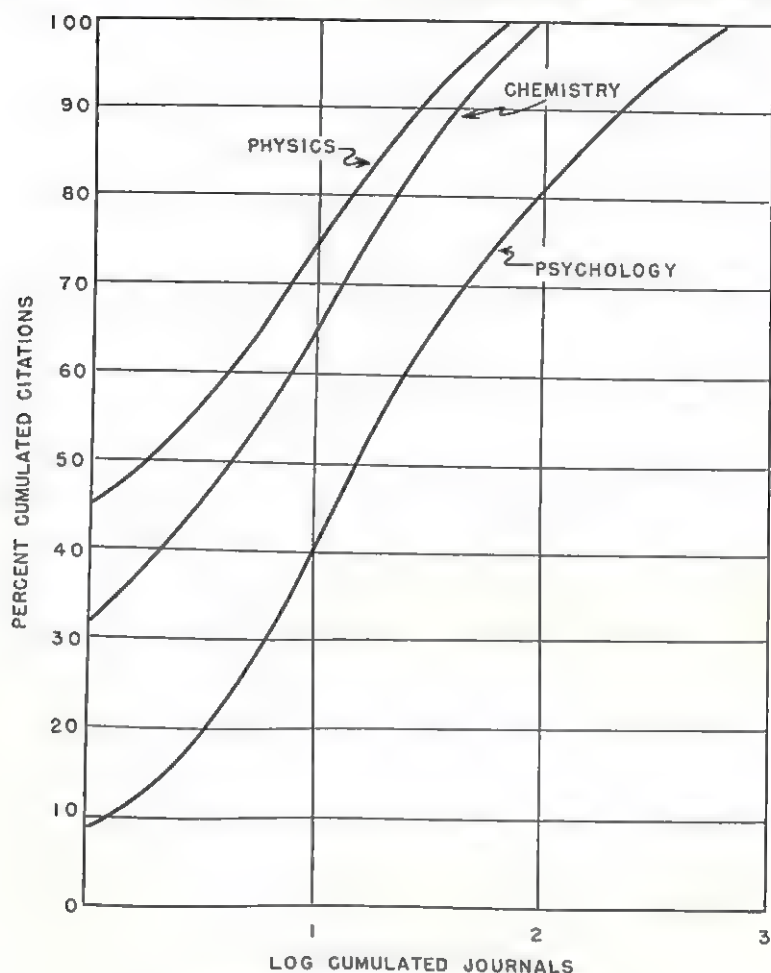
ered for a topic such as "lubrication." Within the primary zone the logarithmically plotted curve is positively accelerated.

The procedure for such an analysis is to rank the citation sources according to their yield. For example, for the 1948 *psychological* literature, one journal was cited 455 times, the next 263, the next 247, and so on down the list. Eventually there were ties—e.g., two journals gave 32 citations each, four gave 17 citations each, nineteen gave 5 citations each. Finally, 345 journals were cited only once each. Next the number of journals was cumulated. The total citations per rank were determined, cumulated, and transformed into log values. The Bradford "law of scattering" is shown by a plot of the cumulated citations against the logarithm of the cumulated journals required to furnish them.

The resulting curve for psychology's needs for the year 1948 is shown in Figure 4. It will be apparent that the early part of the curve does indicate that about five journals dominate the picture by producing a greater number of used citations than would have been indicated by a straight log function, thus furnishing a basis for the primary zone concept. However, the upper part of the curve is clearly a negatively accelerated function, making the whole curve an ogive. This would seem to indicate that psychology depends proportionately more upon its own contributions and proportionately less upon its remote relationships than it does upon its near kin.

This picture needs to be compared to other sciences rather than to a narrower problem such as that used by Bradford. Fussler's (4) data on the literature of both physics and chemistry for the year 1946 were borrowed and transformed into log values and plotted for comparison with psychology. In both cases these curves depart from the linear at each end in the same way as did psychology. Both of them, and especially physics, show a greater proportion of the mid-section to be linear, however. Fussler's data result from a *sampling* of 1946 citations.

As a working hypothesis, we may suggest that, for the scientific disciplines as we commonly accept them, there are three zones of relationship with the whole of science. Zone 1 is that narrow group of sources which furnish extraordinarily high yield (4 journals with a mean of 300 citations per journal for psychology, 1948) and constitute the core of the science. Zone 2 is made up of specialties

FIGURE 4. *Cumulated citation needs.*

within the science, closely cognate areas, and cross-science areas between them. In this zone there is a moderate ratio of yield (31 journals with a mean of 77 citations). Zone 3 represents the far-reaching contacts of the science into the general body of human knowledge and thought, including specific but remote sciences. Here the contribution is quite low (420 journals with a mean of 4 citations). This method of analyzing any science or any journal ought to prove fruitful in evaluating its status with respect to the extensity and character of its dependence.

It is evident from this discussion that the literature of psychology is voluminous and pertinent materials are to be found in an extremely wide range of subject fields. Our purpose in this chapter is to discuss the nature of this literature and to review a number of specific types. A basic dichotomy governing our discussion is between primary and secondary publications. Primary publications are those which present the first published accounts of research, investigation, theory, clinical reports, and all the other kinds of writing that the psychologist engages in to communicate his professional and scholarly activities. Secondary publications by definition depend upon the primary publications. They include abstracts, bibliographies, dictionaries, encyclopedias, and such works, which have a reference function first of all. Although there may be disagreement, we class textbooks as secondary publications.

PRIMARY PUBLICATIONS

The bulk of original research reports, theoretical papers, case reports, and other primary publications are published in technical journals or in irregularly appearing, numbered series of monographs. Such publications are technically known as serials, or continuations. Other primary publications are found in independently printed pamphlets and in monographic books.

Serial Publications

A *serial*, or *continuation*, is a publication appearing more than once under the same title and having some indication of continuity, such as continuous pagination over a period of time or by numbering each issue in sequence of appearance. There is usually a stated or implied commitment for indefinite publication, although specific time or periodicity of publication is not a requirement.

Serials which are published irregularly, with no certain number of issues over a given period of time and with each issue being typically a separate article, are commonly called *monographs*. Pagination may be continuous or discontinuous, but issue (sequence) numbers are always continuous. Subscribers to monograph serials are frequently guaranteed a minimum number of pages per year, in lieu of a promised number of issues. Monographs are frequently sold only as separates, the price varying from issue to issue.

Serials which appear according to a regular publication plan are

known as *periodicals*. Frequency of appearance differs, but is typically weekly, biweekly, monthly, bimonthly, quarterly, or sometimes annually. Occasionally the periodical shows the influence of the academic year and appears in nine or ten issues annually. A technical periodical is usually called a *journal* and the term often is a part of the title. Its pagination is continuous for a volume, which is most often the issues of a calendar year, but may be a half year or sometimes two years. Non-technical periodicals are commonly called *magazines*. Usually these are not paginated continuously. In either case issues are numbered in sequence of appearance and are complete for a volume.

Serial Guides. Brief mention should be made here of the reference guides for serial titles. These aides should not be confused with the guides to periodical literature (discussed in Chapter 4), which are for the purpose of locating titles of articles which make up the *contents* of serials.

The standard library tool is the *Union List of Serials* (A 15), published in its second edition in 1943 and with a supplement in 1945. Further supplements are planned. This very useful reference work supplies title and publication information for about 125,000 serials of the world, and gives the holdings of the major libraries in the United States for each title. The *Union List of Technical Periodicals* (A 61) is a complementary work covering about 5,000 scientific and technical serials. There are 187 titles listed here which are omitted from the Union List. However, the libraries mentioned are specialized and technical rather than university.

If the title is known and the researcher wishes to discover the general nature of the contents, the best procedure is to search the various series or cumulations of the *Library of Congress Printed Catalogue Cards* (A 5-8). This is a guide to the holdings of the Library of Congress and to the printed catalogue cards available from that institution. By referring to the subject tracing (see Chapter 5) one may determine the subject classification.

Ulrich's Periodicals Directory (A 14) is an extensive but selected listing of periodicals classified by major subject matter. Specialties within subjects are often given, as are special contents and information concerning where indexes or abstracts may be found. Publication data are also presented for the approximate 7,500 entries.

Serials of Psychological Interest. Earlier in this chapter a study of Daniel's was referred to in connection with the dispersion of psychological literature among a variety of subject fields. This same study affords more detailed data on the spread of psychological interest and the concentration in certain areas as reflected in the citations to the literature. All references made in original articles in the 1948 volumes of 19 "core" journals (see Table 10 for the list) were recorded and then analyzed to determine the contribution to 1948 citation needs from (a) individual psychological journals and (b) cross-science and cognate science fields. Table 9 shows a summary of these results. Previously, in Table 8, these same data were shown arranged for comparison with the subject categories used by Fussler. In the present context, arrangement is by decreasing yield, in order to emphasize the relative dependence of psychology upon itself and neighboring disciplines. The following outline-discussion is an extension and explanation of the data in Table 9. The percentage figures, in the table and in the text, may be interpreted as indicating the degree of dependency or need as revealed by the proportion of citations to the specific journal or class of journals.

TABLE 9

Summary of Subject Areas Cited in Psychological Journals

<i>Area</i>	<i>Per Cent of Citations</i>	
Psychology.....		70.4
Basic psychology (U.S. and foreign).....	63.6	
Co-disciplines.....	6.8	
Cognate sciences and other subjects.....		25.4
Biological sciences.....	13.2	
Education.....	5.2	
Social sciences.....	2.6	
Physics and engineering.....	1.4	
Philosophy.....	.6	
Chemistry.....	.5	
Business and industry.....	.5	
All others.....	1.4	
General periodicals.....		4.2
General science.....	2.8	
Cultural and popular.....	1.0	
Institutions.....	.4	
		<hr/> 100.0

1. Psychological journals (70.4%). Included here are most of those serials with the term psychology, its derivatives, or a major area of psychology as a part of the title. Titles bearing the term psychology along with some other discipline are also included. Further criteria require positive answers to one or more of the following questions: (a) Are a significant proportion of its contributors recognized as psychologists? (b) Is the editor (or some members of the editorial board) so recognized? (c) Does the journal show kinship through a common literature, as revealed by citations, with those serials clearly accepted as psychological? Application of these criteria results in a clear-cut group with few, if any, doubtful cases.

A. United States psychological journals (59.6%). Journals published in this country may be further divided as follows:

- (1) Journals published by the American Psychological Association (35.5%):

American Psychologist (2%).

Journal of Abnormal and Social Psychology (3%).

Journal of Applied Psychology (4%).

Journal of Comparative and Physiological Psychology (5%).

Journal of Consulting Psychology (2%).

Journal of Experimental Psychology (9%).

Psychological Abstracts.¹

Psychological Bulletin (4%).

Psychological Monographs (2%).

Psychological Review (4%).

- (2) Journals published by The Journal Press (11.3%):

Genetic Psychology Monographs (1%).

Journal of General Psychology (3%).

Journal of Genetic Psychology (2%).

Journal of Psychology (3%).

Journal of Social Psychology (2%).

- (3) Journals published independently (9.6%):

American Journal of Psychology (3%).

Educational and Psychological Monographs (1%).

Journal of Clinical Psychology (2%).

¹ Not included in the study because of its specialized character.

Journal of Educational Psychology (2%).

Psychometrika (2%).

- (4) Journals no longer published (2.7%). There are many titles here, but only a few have a sufficient reference to merit listing:

Archives of Psychology (1%).

Psychological Record (.2%).

- (5) Miscellaneous United States journals (.5%). The remainder include a few too "young" to have been quoted extensively, locally produced and informal publications, student-operated serials, and the like.

- B. Cross-science journals (6.8%). This class includes journals which might be classed as psychological in the very widest sense. They are of considerable concern to psychology but also of major interest to other disciplines. Journals in this category are characterized by having psychologists on the editorial board along with members of other professions. Articles may be written by persons in one field or another. Some of these journals, such as those in psychoanalysis or in para-psychology, are isolated—neither quoting nor being quoted to any appreciable degree. The major fields represented are:

(1) Vocational guidance, personnel (1.5%).

(2) Mental hygiene (1.5%).

(3) Statistics (1.3%).

(4) Child care and development (.8%).

(5) All others (1.7%). Includes psychoanalysis, psychodiagnostics, psychotherapy, public opinion, speech disorders, and so forth.

- C. Foreign psychological serials (4.0%). There is far less use of foreign titles in psychology than in some other sciences. Fussler's data (4) show comparable figures for 1946 from physics (46.9%) and chemistry (42.3%). The low percentage for psychology reflects the effects of World War II on research productivity. It may also indicate limited language facility of American psychologists and differences in the nature of the discipline, as noted previously. These categories include both "currently published" and "out of print."

- (1) Great Britain (2.0%).
 - (2) Germany (1.2%).
 - (3) France (.5%).
 - (4) Japan (.1%).
 - (5) All others (.2%). Includes Italy, China, Canada, India, and the Scandinavian countries.
2. Non-psychological, specialized journals (25.4%). This group includes the cognate sciences and other disciplines which are clearly not psychology. The first category is sufficiently large to justify a breakdown in order to see how the pattern develops. The remaining categories are relatively unimportant individually, but collectively they demonstrate once more the impressive scattering of reference needs.
- A. Biological sciences (13.2%).
- (1) Applied biological fields (8.2%).
 - (a) Psychiatry and neurology (4.4%).
 - (b) General medicine (2.2%).
 - (c) Sensory specialties (1.2%).
 - (d) Pediatrics (.3%).
 - (e) All others (.1%). Mostly nursing care.
 - (2) Basic research fields (5.0%).
 - (a) Physiology (2.5%).
 - (b) General biology (1.7%).
 - (c) Endocrinology (.2%).
 - (d) Diet and nutrition (.2%).
 - (e) Zoology (.2%).
 - (f) All others (.2%). Mostly genetics, anatomy.
- B. Education (5.2%).
- C. Social sciences (2.6%). This group is dominated by sociology, social welfare, and anthropology.
- D. Physics and engineering (1.4%).
- E. Philosophy (.6%). Includes aesthetics.
- F. Chemistry (.5%).
- G. Business and industry (.5%). Mostly labor, management, marketing, advertising.
- H. All others (1.4%). Mostly journalism, speech, English, and home economics.
3. General publications (4.2%). Included here are serials which may

be expected to carry some psychological articles but which cannot be classified by journal title or policy.

- A. General science (2.8%). For example, *Science* and *American Scientist* and "science series" published by various universities.
- B. Cultural and popular periodicals (1.0%). Includes newspapers and popular magazines.
- C. Institutional publications (.4%). Mostly the "university series" type.

Analysis of Psychological Serials. Returning to those 19 titles which we have somewhat arbitrarily designated the "core" journals in psychology, we find that the 1948 study reveals several additional analyses worthy of note. Table 10 shows the ways these journals were interrelated. Following across the row for any one of the named journals, one finds the per cent of citations made in its articles to articles in each of the journals named in the columns. This we have called the "dependence function." Subtotals are given for each of the three major classes of psychological journals included in the analysis. The total per cent (last figure in the row) shows the per cent of dependence by the indicated journal upon all the "core" journals. The figure would be only slightly higher if obsolete, foreign, and miscellaneous psychology titles were included. Psychology journals differ rather widely in their dependence upon psychology journals. Specialized contents, age, and other factors must be kept in mind in interpreting these figures.

A diagonal drawn from upper left to lower right would cut across figures indicating the degree to which journals depend upon their own past contents for citations—an index of inbreeding. Again the variation is large—older journals, specialized journals, and those closest to traditional research tend to have the higher percentages.

A picture of the "contribution function" of a journal is found in the columns. Subtotals and totals are also presented. In spite of the fact that some of these journals are specialized and some are very young, no journal supplies less than one per cent of all needs. This would, of course, be different if the journal's own needs were excluded. Outside of the *Journal of Experimental Psychology* (9%), the contribution factor is well spread over the group.

TABLE 10
Interrelationships of Psychology Journals

Percentage of all citations in																								
Which referred to articles in																								
	Amer. Psychol.	J. abn. soc.	J. app.	J. comp. physiol.	J. consult.	J. exper.	Bull.	Monog.	Rev.	All APA	Genet. Monog.	J. gen.	J. genet.	J. Psychol.	J. soc.	All Jour. Press	Amer. J. Psychol.	Educ. Psy. Meas.	J. clin.	J. educ.	Psychomet.	All "other"	ALL PSYCHOL.	
Amer. Psychologist.....	26		2	1	10	0	8	1	1	52	1	0	2	1	0	3	2	1	1	9	1	0	13	68
J. abn. soc. Psychol.....	1	12	2	2	2	2	4	3	4	31	<1	1	1	4	2	9	2	0	0	4	3	3	12	42
J. app. Psychol.....	2		23	0	1	1	4	2	1	36	1	0	1	3	4	6	8	0	1	0	1	2	57	
J. comp. physiol. Psy.....	<1		13	22	0	11	5	4	5	43	<1	1	1	10	<1	14	9	0	0	<1	<1	1	14	75
J. consult. Psychol.....	2		13	5	13	0	6	3	2	47	<1	1	1	1	1	19	2	0	1	1	1	11	68	
J. exper. Psychol.....	1		<1	1	<1	32	7	4	7	53	1	3	3	3	1	17	5	0	<1	1	4	9	23	
Psychol. Bull.....	<1		2	11	<1	12	4	3	4	41	<1	1	1	3	1	14	3	0	1	1	1	14	55	
Psychol. Monog.*.....	1		7	1	1	4	4	3	4	24	1	3	4	2	2	7	7	<1	0	1	1	6	73	
Psychol. Rev.....	1		0	10	0	12	4	3	22	55	1	3	4	2	2	12	5	<1	0	<1	1	6	73	
All APA Journals.....	2	3	4	7	2	11	4	3	6	44	1	3	2	3	1	10	4	<1	2	2	1	10	64	
Genet. Psychol. Monog.*.....	2	4	9	0	2	0	5	1	1	21	5	1	1	6	2	14	2	4	1	4	1	11	47	
J. gen. Psychol.....	1	6	4	3	<1	10	4	4	7	41	1	8	1	4	2	16	5	<1	1	2	1	10	66	
J. genet. Psychol.....	0	2	4	5	2	1	2	2	2	18	4	2	4	5	2	20	1	1	0	7	<1	9	48	
J. Psychol. f.....	0	3	8	0	1	1	5	0	0	22	2	4	1	4	3	24	1	0	0	<1	1	2	47	
J. soc. Psychol.....	1	10	4	1	0	2	0	0	0	17	1	3	0	4	15	23	4	1	0	2	0	7	48	
All Journal Press.....	<1	4	5	2	1	2	3	2	3	24	2	4	2	6	4	19	3	1	<1	3	1	7	51	
Amer. J. Psychol.....	1	0	2	2	0	17	4	1	2	28	0	2	2	1	0	5	19	0	0	<1	<1	20	53	
Educ. Psychol. Meas.....	2	2	7	0	1	1	6	1	0	18	1	3	2	2	1	8	1	12	2	4	7	27	53	
J. clin. Psychol. f.....	0	5	4	0	5	0	9	1	1	26	0	1	1	3	0	5	0	0	3	0	0	3	34	
J. educ. Psychol.....	2	1	1	0	1	6	2	2	3	18	<1	1	1	1	1	4	3	<1	0	9	2	14	37	
Psychomet.....	0	2	4	1	0	0	3	2	2	12	0	2	0	0	1	3	1	4	0	9	18	32	47	
All "other" journals.....	1	2	3	1	1	6	5	1	1	21	<1	2	1	1	<1	5	6	3	1	4	4	17	44	
ALL PSYCHOLOGY.....	2	3	4	5	2	9	4	2	4	35	1	3	2	3	2	11	3	1	2	2	2	10	56	

*1947; †1946; all others 1948

Although the functions and fields of these journals are widely publicized and generally known, it is of considerable interest that we can further quantify and diagram them. Percentages from the table were converted to ranks and *rho* computed for each journal's "dependence function" (the row) against its "contribution function." This reveals the degree to which a journal is a member of a self-contained or relatively independent "household" within the larger family of psychological journals. A high positive correlation would indicate that various journals tend to depend upon journal X for citations in the same relative magnitude as journal X cites each of them. This may be called a "coefficient of mutuality." These coefficients are shown in Table 11. A negative correlation shows that

TABLE 11

Coefficients of Mutuality for Psychological Journals

<i>Journal of Comparative and Physiological Psychology</i> . . . .	.79
<i>Journal of Experimental Psychology</i> . . . . .	.79
<i>Psychological Review</i> . . . . .	.71
<i>Psychometrika</i> . . . . .	.68
<i>American Journal of Psychology</i> . . . . .	.67
<i>Journal of Psychology</i> . . . . .	.57
<i>Journal of Consulting Psychology</i> . . . . .	.55
<i>Educational and Psychological Measurements</i> . . . . .	.52
<i>Journal of Clinical Psychology</i> . . . . .	.45
<i>Journal of General Psychology</i> . . . . .	.43
<i>Psychological Monographs</i> . . . . .	.39
<i>Journal of Social Psychology</i> . . . . .	.38
<i>Journal of Educational Psychology</i> . . . . .	.28
<i>American Psychologist</i> . . . . .	.26
<i>Journal of Abnormal and Social Psychology</i> . . . . .	.26
<i>Journal of Applied Psychology</i> . . . . .	.15
<i>Journal of Genetic Psychology</i> . . . . .	.01
<i>Genetic Psychology Monographs</i>	-.03
<i>Psychological Bulletin</i>	-.41

the more a given journal borrows from journal X, the less likely is it that X will borrow from it. Thus, the *Psychological Bulletin* seems to *transmit* basic research from one group of journals to another.

An even more revealing picture results from an analysis of the intercorrelation matrix of all 19 journals made on the basis of the dependency function. This procedure is based upon the assumption that two journals may be said to be related if the percentage yields

from each of the psychological journals shows a similar pattern. The matrix, which is not reproduced here, reveals coefficients ranging from .99 (the *Review* with *Experimental* and also with *Comparative and Physiological*) to $-.48$ (*Experimental* with *Educational* and *Psychological Measurements*).

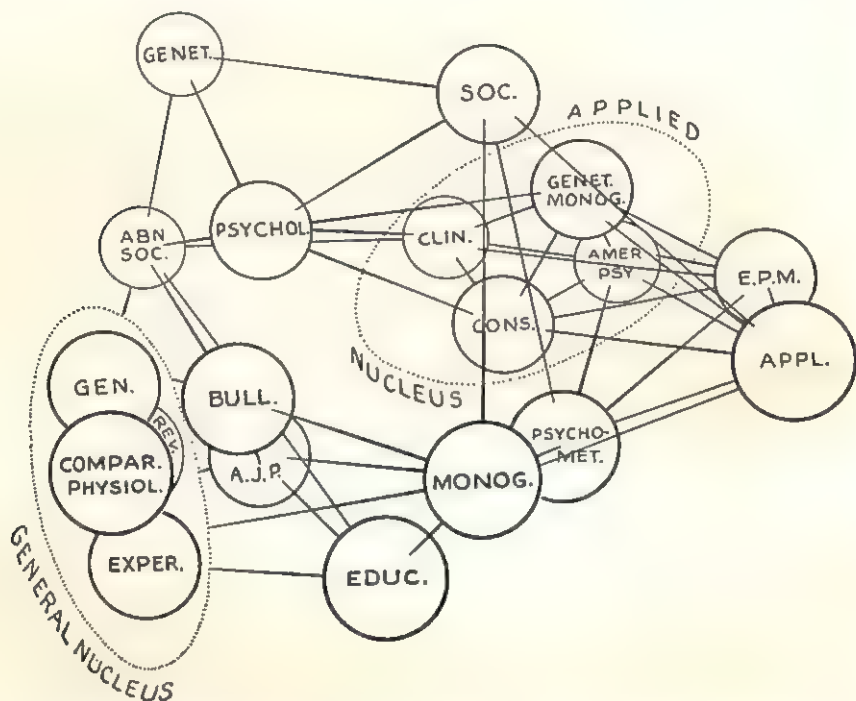


FIGURE 5. Three-dimensional representation of intercorrelations of psychology journals. Lines connect journals which are correlated .25 or more. Journals in the "general (or research) nucleus" are correlated about .95 with each other; those in the "applied (or professional) nucleus" about .80. The Psychological Monographs and the Journal of Psychology seem to serve as links between the general cluster on the left and the more complex cluster on the right.

By the use of a modification and extension of Tryon's (7) cluster analysis technique we may derive a notion of the subfamilies within the whole group. If two or more journals have similar patterns of relationships (correlations) within the matrix, they may be said to represent a common "factor." The relationships shown by this procedure are diagrammed in Figure 5. It is not surprising that the

patterns are similar to those which might be obtained subjectively by a person with a thorough knowledge of these journals.

There are two clear-cut clusters (or factors), which we shall name somewhat arbitrarily (as in factor analysis procedure) *general psychology* and *applied psychology*. Each of these is composed of a nucleus of four journals. Those in the general nucleus are more closely interrelated than are the four in the applied nucleus. Surrounding each nucleus are other journals, each related to all members of the nucleus but much less so than the nucleus members are related to one another. Surrounding the general nucleus is a constellation of journals which appears to form a kind of *group factor*. Journals surrounding the applied core are more like *specific factors*, but are still interrelated. Two journals are distantly related to both cores. Lengths of connecting lines in the diagram are inversely proportionate to pattern similarity. Absence of lines indicates no reliable positive relationship. Occupants of one nucleus are clearly negatively related to occupants of the other nucleus.

The preceding discussion furnishes evidence that the journal literature of interest to psychologists is not limited to periodicals in their specific field. In 1933, Louttit (A 112) published a bibliography of 1,004 journals in psychology and related subjects. This bibliography furnished the basic data for an analysis of the history of journal publishing (6), which need not be repeated here. In Appendix B is presented a very selective bibliography of journals specifically in psychology. These were selected from the *Union List of Serials* on the basis of having the word "psychology" in their titles or because of personal knowledge that they were known to be exclusively or primarily psychological in their editorial content. An analysis of the titles in this bibliography, in respect to countries of publication, languages, and dates, has been presented in Chapter 2.

As Daniel's study shows, a relatively small number of the journals on the list are in a group with which psychologists ordinarily have a working familiarity. Almost all currently published journals have a more or less carefully defined policy concerning the type of material they publish. This is usually defined in terms of special subject matter, although, in a few instances, it may be kind of publication as, for example, *Psychological Abstracts*. The student will soon learn which journals include material about his special interest. He should make a point of developing a familiarity with all American journals

and major foreign ones. In American journals, at least, there is usually a description in each issue of the kind of manuscripts desired and how they should be submitted and printed. A summary of this information is presented in Chapter 8.

Government and Institutional Publications

U.S. Federal Government Publications. The United States government, in its many bureaus, offices, and departments, publishes a very great number of titles each year. Most of these are not of psychological interest, but such agencies as the Children's Bureau, the Office of Education, and the Public Health Service, to mention only a few, have issued many popular and technical monographic works of psychological interest. Since World War II, a large number of military contract researches have produced considerable volumes of reports usually issued in processed form. Unfortunately, there is no simple, convenient way for psychologists to keep track of material which may be of interest. For a number of years *Psychological Abstracts* has endeavored to include government publications, but because of the complexity of finding them its coverage has been far from complete.

Most publications of the federal government are prepared in a department or bureau, are printed by the Government Printing Office, and are distributed, i.e., sold, by the Superintendent of Documents. The issuing department usually has a supply of its publications available for free distribution for a limited time following their publication. Also, many publications may be secured by a request to a Representative or Senator. If free copies are not available, most publications may be procured from the Superintendent of Documents. However, this official, by statute, cannot distribute free copies but must sell them.

The Superintendent of Documents "advertises" what he has for sale in three ways. A biweekly list, *Selected United States Government Publications*, will be sent regularly upon request. Secondly, the Superintendent's Office publishes a comprehensive *Monthly Catalogue* (A 17), which lists all publications available from his office and many additional ones that are printed for official use only, or which have been referred by other bureaus for listing. This *Monthly Catalogue* has as complete a record of current government publications as exists. Thirdly, the Superintendent issues a number

of price lists for publications in different subject areas. These price lists are available upon request and are revised from time to time. The following topics of psychological interest may be found in the price lists indicated by numbers following each term:

animals 21, 38	employment 33	National Resources
census material 70	fishes 21	Planning Board 20
child labor 33	health 51	occupations 33A
Children's Bureau 71	Indians 55	photography 64
consumers 76	insects 41	population 70
crime 54	labor 33	racism of man 67
defense 77	libraries 31	Smithsonian 55
diseases 51	measures 64	UNESCO 77
drugs 51	National Academy	Veterans affairs 19
education 31	of Science 55	Vocational educ. 31
	National Museum 55	wild life 21

There are several bibliographic works concerned with earlier government publications. None of these lend themselves to easy research for psychological material. Information concerning them can be found in Louttit (*A 113*) and in Boyd and Rips (*1*).

Publications of Other Government Units. Foreign governments, as well as state and local governments within the U.S., are engaged in a certain amount of publication activities. Unfortunately, the bibliographic techniques of dealing with this literature are enormously complex, and there is a complete lack of subject bibliography from the point of view of psychology. The Library of Congress does publish a *Monthly Check List of State Publications* (*A 16*), but this includes only documents received by the Library and, though extensive, is not intended to be an exhaustive list. Except in the area of education, and incidentally in some other applied fields, the amount of literature of psychological interest in the publications of states or foreign governments is very small. This material is also included in *Psychological Abstracts* insofar as the editorial staff can discover it.

Institutional Publications. A number of large universities and other scholarly institutions maintain serial publications under a variety of titles. Those of a specifically psychological nature are included in the bibliography in Appendix B. These publications are usually monographs and are issued irregularly. This type of material is very completely covered in the usual guides to psychological literature.

Non-serial Primary Publication

Before the common use of the journal as a means of communicating scholarly material, research reports, systematic treatises, and theoretical discussions were published in the form of books or pamphlets. In a more limited way, such types of publication are still in use today. Books published by commercial or non-profit companies, regardless of size, are almost all included in the usual bibliographical guides, both general and psychological. The publishing of independent pamphlets, especially in mimeographed or non-printed forms, is to be deplored. Unless the author is extremely careful to see that copies reach the proper bibliographic centers, they are likely to be difficult to find and remain essentially unknown.

SECONDARY PUBLICATIONS

Secondary publications are those which present selected material from primary publications in some sort of integrated or logical arrangement. They include general reference works ranging in one dimension from dictionary to textbook and in another from the specialized work of value to a limited subfield within psychology to the most generally usable reference volume.

The plan of this section is to classify, define, and illustrate different types of works from the area of secondary publications. Certain reference books of special significance will be considered in some detail. In Appendix A we present a classified and annotated bibliography of reference titles useful to psychology.

Reference Books

A reference book, as its name implies, is a book to which one refers for a particular bit of information. In order to facilitate such use, material is usually arranged according to some simple coded scheme, for example, alphabetically. However, any book with a good index may serve the functions of a reference book, regardless of how the material is arranged.

When information becomes firmly established and is of some general usefulness and importance, it soon appears in reference form. The obvious savings in time and effort involved in locating material through such sources are of considerable value to the scholar. He must, of course, be assured of the dependability of his

source. The careful scientist is not content to use secondary sources where interpretation or bias of the compiler may have influenced the character of the material, or where selection has unduly restricted its range.

In the following subsections, classes of reference books follow the typical library nomenclature. However, the user of reference materials soon discovers that there are few examples which fit definitions precisely. The kinds of reference materials are much more clearly distinguishable on principle than in practice.

Dictionaries. The most fundamental of all reference works is the dictionary, or *definition book*. It is scarcely necessary to point out here that a good general dictionary is a necessity for the student at any stage of professional maturity. There are, of course, a number of good dictionaries available, and we need only recommend that the psychologist have available one that is up-to-date, unabridged, and as large as he can afford.

A type of specialized dictionary is the *word-book*, commonly known as a *thesaurus*. Judicious use of such an aid will be of considerable value in the improvement of style in both written and oral scientific reporting. Word-books give synonyms and antonyms. Thus, by proper use, the exact term to express an idea may be found. Several of these books will be available in any library.

In oral reporting, the neophyte, and all too often the professional as well, encounters difficulty in the pronunciation of proper names. Seminar reports are sometimes marred by the speaker's error, hesitation, or request for aid in the pronunciation of the name of the person whose work is being reported. There is no pronouncing guide to names of psychologists, but general references of this type may be useful. Two of these are listed in the bibliography (A 42, 43).

Interlanguage (polyglot) dictionaries will be used by the scholar frequently. The graduate student usually becomes familiar with one or more of these in preparation for his language requirement. A number of general dictionaries for the languages most useful to psychology (German, French, Russian) may be found in any university library and are readily purchased at bookstores. Excellent polyglot dictionaries of scientific terms are in wide use, and two word lists confined to psychological and closely related terms are available (Duncker, A 145, and Ruckmick, A 148). Many polyglot dictionaries are listed in Appendix A.

Technical dictionaries in cognate subjects are occasionally needed by the psychologist interested in borderline areas. Good specialized dictionaries are available for education (A 289), philosophy (A 142), sociology (A 214), social welfare (A 217), psychiatry (A 267, 268), biology (A 101, 103), and medicine (A 99, 100, 102, 104).

There are five psychological dictionaries in English. The oldest is Baldwin's (A 138), first published in 1905 and reprinted with corrections in 1940. Warren's *Dictionary* (A 143) is considered by many psychologists to be the standard reference of this type, although there are some new terms since its publication in 1934. It defines upward of 8,500 terms, more than any of the other modern dictionaries, and features several useful appendices plus a short bibliography of other sources. Shorter dictionaries by English (2,000 terms) (A 140), Harriman (3,300 terms) (A 141), and Drever (4,500 terms) (A 139) are all very useful. General psychological dictionaries have appeared in several foreign languages. These are included in the bibliography in Appendix A.

A few useful dictionaries covering specializations within psychology or cross-science areas have appeared from time to time. Notable among the list are works in the fields of measurement and guidance (A 244), industrial psychology (A 305), counseling of the handicapped (A 245), occupational titles (A 243), and statistics (A 180).

Many lesser word lists, definition lists, glossaries, and the like may be found scattered in the psychological literature. Since 1947, *Psychological Abstracts* has indexed major glossaries in textbooks, and has abstracted dictionaries considered to be of value to psychologists. Louttit (A 113, pp. 62-68) reviewed many of the older reference guides of this type, both within psychology and in cognate areas.

Encyclopedias. In contrast to the dictionary, the encyclopedia is a *discussion* book, but still retains the alphabetical organization of material as in the dictionary. Subjects are treated more or less exhaustively, and frequently are major essays on topics of wide interest. In the better encyclopedias these discussions are authoritative, up-to-date, and documented. They are often signed by a writer who is a recognized authority in his subject. Since they serve to select the most important phases and facts pertaining to a topic, the student may well consider an encyclopedic source as the starting point for the construction of a bibliography, as suggested in Chapter 4, or for any quick overview of the nature of a problem.

The more scholarly general encyclopedias, such as the *Britannica* (A 49) or the *Americana* (A 48) may serve the psychologist in his professional work as well as for cultural reading of a wider nature. It is interesting to note that the article "Psychology" in the ninth edition of the *Britannica*, written by James Ward, is considered a classic.

Scientific fields in general, and the natural sciences in particular, are not well supplied with encyclopedias. The two we list (A 82, 86) tend to cover technology or applied fields better than basic science. This situation has been attributed to the rapid changes in the sciences and the high degree of specialization, which makes textbooks a more suitable source of material. Psychology is not covered with any adequacy in either of the scientific encyclopedias listed.

There are some encyclopedias in cognate areas. The field of education is best supplied with this type of reference book, but others may be found for the social sciences and a few other specific subjects. Such encyclopedias, even more than general ones, should have considerable usefulness to the psychologist who wishes to keep informed on pertinent problems related to his major field of interest. Perhaps Monroe's *Encyclopedia of Educational Research* (A 292) is the best example of this point. Psychologists should find much use for this book. It is authoritative, well indexed, and well documented, and the articles point out needs as well as survey progress.

The *Encyclopedia of the Social Sciences* (A 220) is intended for use by the scholar, the student, and "for the creation of a sounder and more informed public opinion." It is considered as a basic tool in the fields it covers—anthropology, social work, economics, history, political science, sociology, statistics, law, education, and psychology. However, it appears to be somewhat sketchy for psychology except on a few selected topics. Other encyclopedias listed, under the editorships of Fern (A 218), Hastings (A 219), and Radford (A 221), contain social topics and should also be consulted in the area of social psychology.

Although Baldwin's exhaustive reference work, appearing early in the century, has been classified as a dictionary, it is in many respects more like an encyclopedia of philosophy and psychology. This work has stood as a most important source book, despite its age. In addition to definition, it gives elucidation of terms by interpretations of the "movements of thought through which the meanings . . . have

arisen, with a view to discovering what is really vital in the development of thought and term in one" (A 138, p. vii). Considerable biographical and historical material is also included.

Harriman's *Encyclopedia of Psychology* (A 156) is the only recent attempt to provide the science with an inclusive encyclopedic guide. The need for such a work had long been felt, but Harriman's one-volume book was a disappointment to many. Critics have pointed out many serious content flaws, the most damaging being the ill-planned allocation of space. The greater emphasis upon parapsychology than upon learning, for example, is scarcely consistent with the stated purpose "to emphasize some of the trends in contemporary psychology which seem to have supplanted much of the traditional material" (p. iii). Those concerned with bibliographic work will find this encyclopedia useful as a horrible example of hodgepodge in citation form. In spite of its shortcomings, many articles are of expected encyclopedic quality but they must be judged individually. It is not a book to be recommended to an outsider as representing psychology in a properly balanced fashion.

Collections. Many reference books which are called handbooks (or, in German, *Handbuch*) are often so nearly like encyclopedias for specialized areas that we shall consider them next under the standard library term *collection*. The typical handbook is more precisely a collection of monographs, whereas the typical encyclopedia is a collection of summaries. Since the term *handbook* is frequently used in another sense (see next section), careful definition is all the more important. There are two recognized types of collections: reprint collections (commonly called *readings*) and original collections (*symposium*, *anthology*, *collaborated text*, or *handbook*).

The first of these types has become exceedingly popular in psychology in recent years. As valuable works become lost or unavailable in original form and are widely scattered, this means of collection and reproduction has considerable merit. Its value lies in careful selection and in physical compactness. Usually an editor of such a work not only selects, but also organizes and sometimes adds interpretations for the reader. The growing list of titles now includes readings at advanced as well as introductory levels.

Psychology is obligated to Carl Murchison for first popularizing the original collection form in this country. Between 1929 and 1933 appeared four volumes under his editorship in the fields of experi-

mental psychology (A 169, 170), child psychology (A 193), and social psychology (A 222). Students are still willing to pay rare-book prices for his out-of-print *Handbook of General Experimental Psychology* (A 170).

More recent outstanding examples of valuable contributions in this reference form include coverage of personality (A 272), child psychology and child guidance (A 191-194), vocational guidance (A 249), comparative psychology (A 172), correctional psychology (A 250), methods of psychology (A 173), applied psychology (A 157), and experimental psychology (A 171). Since it is impossible to differentiate sharply between the *collection* as a reference book and the multiple-author textbook, we have also included in the bibliography a number of titles which are meant to be examples of the latter type. The reader may justifiably wish to add other items of his own choosing. Steven's *Handbook of Experimental Psychology* (A 171), described as a distinguished achievement in scientific commentary, is clearly within our definition, as is also Fryer and Henry's coverage of applied psychology (A 157), broadly defined.

Handbooks. The other meaning of this term, and the one most familiar to American students, is in the sense of a *fact-book* or a *how-to book*. We may define the handbook as a compendium of established facts, arranged by classes, and not seriously affected by the passage of time. In a sense, the handbook is a kind of brief encyclopedia without discussion, evaluation, or extended description.

Handbooks from cognate and cross-science areas are of value chiefly in reference work as a background for research problems. Investigators in the experimental or physiological areas particularly will find significant sources listed from the fields of physiology (A 107), physical sciences (A 80-81), and electricity-electronics (A 174, 175). Statistical reference material of various kinds is abundant in the handbook form. Other areas within psychology for which one or more handbooks are useful include animal behavior (A 106, 108), abnormal psychology (A 271), psychometrics (A 247, 248, 251), personnel selection (A 301), and engineering psychology (A 306).

Buros' (A 176, 226-230) several volumes on mental tests and statistical methodology, although sometimes containing the term *year-book* in the title, are essentially handbooks for the area covered. Their purpose is to present original and reprinted critical reviews in an effort to give the user the benefit of wider experience in the use of

tests or statistical procedures. Much pertinent factual material is also included. These books have had wide use in psychology for several years.

Yearbooks. Yearbooks are annual fact-books, or those whose contents become dated and in some cases superseded by more pertinent information. The *World Almanac* (A 50) is a widely used example of this form. Each issue covers a tremendous amount of compactly presented data of many sorts, accumulated during the preceding calendar year. The two general encyclopedias previously mentioned issue annual supplements covering significant developments during the year, thus extending the usefulness of the basic set. A similar function is served by the *American Year Book* (A 44), which emphasizes U.S. progress, including scientific developments. Both the social and the natural sciences are represented, and lists of societies and research institutions are provided.

In some cognate fields annual reviews of progress are available. Annual Reviews, Inc., of Stanford, California, publishes such yearly summaries in several fields including psychology, each one in cooperation with the professional society or leaders in the field concerned. In education, the National Society for the Study of Education issues a yearbook (A 295) in two volumes. These are devoted to one or two significant subjects each year and prepared in monograph form. Many of these yearbooks have been of direct psychological importance. Volume 39, for example, was concerned with the nature-nurture problem. Although the *Social Work Yearbook* (A 224) actually appears every other year, it otherwise fits the definition of an annual review. The sections on guidance and counseling and on mental hygiene are of most interest to psychologists.

The *Annual Review of Psychology* (A 155) is a recent addition to the series just mentioned. In its first few issues the quality of articles has varied considerably, some taking the form of a kind of running, annotated bibliography, whereas others are excellent integrative surveys. Major fields of the science are reviewed annually; smaller subject areas may be reviewed at longer intervals.

Directories. Directories are largely *location guides* for persons or organizations, although they usually give more information than merely names and addresses. Directories of persons give biographical information which is more or less complete. Directories of organiza-

tions provide significant details of founding, membership, purpose, activities, present officers, and the like.

Among the many available biographical directories which include psychologists as well as persons in other professions and occupations, mention should be made of *Who's Who in America* (A 37). This "best-known" of the biographical guides is revised biennially and includes listing of individuals selected "1. on account of special prominence in creditable lines of effort, making them the subjects of extensive interest, inquiry or discussion; and, 2. those included arbitrarily on account of official position—civil, military, naval, religious, or educational." Quite a few other "who's who" type of directory are available—regional, professional, specialties, deceased, who knows, and others—although these have not all been listed in the bibliography. Frequently the less well known guides are more helpful than might be expected.

In the field of psychology, the most useful source of biographical information is the *Directory of the American Psychological Association* (A 133), an annual publication. The by-laws of the Association, past officers and annual meetings, organizations with which the APA is affiliated, and information about the divisions of the APA are included. The main body of the book is made up of the alphabetical listing of the members, regardless of which class of membership they hold (see Chapter 11). There is also a listing of names by geographic distribution and by divisional membership.

Until 1948 the listings included very limited biographical data. As the Association grew rapidly following its reorganization in 1945, it was decided to publish a directory with full biographical information. The first of this type appeared in 1948 and the second in 1951. The present plan is to publish this directory every five years, with a briefer listing in the intervening years. The annual directory includes for each member only the name, address, present position, latest degree, class of APA membership, and divisional membership. The biographical directory lists the name, address, place and date of birth, sex, academic degrees with date and institution, scholastic honor societies, past professional positions held, present position and title, offices held in the APA, membership in other societies, stated interests in psychology, diplomate and/or certification status (where applicable), and class of membership with the year it was attained.

Additional biographical information about psychologists may be found in the two directories edited by Murchison (A 136, 137) and the Cattell (A 70, 287) directories.

Psychologists and students of psychology frequently need information concerning organizations and institutions. The most useful of these directories have been included in Appendix A. Scientific societies (A 72, 73), psychiatric clinics (A 242), social welfare agencies (A 224), and institutions of higher learning (A 285, 286, 288) are included. The graduate student, or prospective graduate student, should notice particularly the directory of psychology departments offering graduate work and stipends (A 134). This is expected to continue as an annual service provided by the APA.

Catalogues. Sooner or later, psychologists make use of catalogues of books, laboratory and research apparatus, teaching aids, and mental tests. These are necessary reference materials when one is making purchases for the library, laboratory, classroom, or clinic. They also frequently supply other useful reference information, but one must be cautious about the uncritical character of such information. One apparatus manufacturer (Stoelting) provided citations to descriptions in original literature of many listings in his 1929 catalogue, a practice which should be encouraged.

Apparatus manufacturers issue catalogues or small brochures describing their offerings. University purchasing departments usually maintain files of the larger, general science apparatus dealers and of manufacturers of tools, parts, and raw materials. Unless the department maintains its own file, apparatus of a specifically psychological nature may be difficult to locate. In 1950, a committee of the APA compiled a list of 108 manufacturers or dealers from whom psychological apparatus is available. This list has been considered in compiling Appendix C. A number of these firms are prepared to construct apparatus for individual needs from drawings submitted by the psychologist.

Major book publishers issue annual catalogues in addition to announcements of individual books released. Those who have extensive listings in psychology provide separate catalogues for this subject or with closely related subjects. The most convenient single source is the annual collection of catalogues (A 3, 4) included in the bibliography. A list of names and addresses of major publishers who

have extensive listings in psychology has been included in Appendix C.

There are quite a few distributors of educational 16-mm. motion picture films. One of these, listed in the bibliography, specializes in psychological subjects (A 132). We have also included four additional information sources for visual aids (A 128-131). Many universities now maintain a visual aids bureau, which will serve the department in the purchase, rental, or loan of films. Frequently a service for making slides or strip films is available on the campus. Other types of teaching aids are not so easily located, but the well-supplied departmental catalogue file will probably reveal a few other items in this classification. In Chapter 9 will be found a short discussion on the proper use of these materials in the classroom.

Psychological tests are described in catalogues of the publishers whose names and addresses are also to be found in Appendix C. It should be noted that specimen sets of most tests are available at small cost to responsible professional people. A collection of these makes a worthwhile departmental reference file.

Books

No comprehensive separate listing of the books of psychology is known to exist. Undoubtedly several thousand titles would need to be included in such a compilation. Many attempts have been made to collect listings of the most significant titles, usually for the purpose of aiding graduate students in their task of gaining a comprehension of the field. Such lists are also valuable as guides for the building of a personal professional library. Two of the best known in psychology (A 111, 121) and one from psychiatry (A 261) are among those listed in Appendix A.

Location Information about Books. Book guides are indispensable in tracing correct titles, dates, publishers, and prices. Any good library will have available one or more of the standard reference guides designed for this purpose, the most important of which are listed in a subsection of Appendix A. For information about the subject or contents of a book, the publisher's description or the Library of Congress guides (A 5-8) will serve. The latter are not so easy to use, however, because of the fact that entries are made by date of the Library of Congress card, rather than by copyright date.

Evaluating Books. Just like primary publications, books in psychology vary widely in quality and usefulness. Critical evaluations are sought by the prospective purchaser or instructor as an aid in selection and interpretation. Serving this purpose is the book review (see Chapter 9), found as a regular feature of many of the professional journals. Unfortunately most reviews are available with far too much delay for maximum usefulness. The journal *Psychological Book Previews* (A 127), appearing first in January 1951, in part relieved this problem by presenting authors' reviews at or before publication date.

Unfortunately, prior to 1951 there was no useful method of efficient location of reviews of psychological books. They are not included in the standard review guides (A 26) unless the review has appeared in a popular periodical or in the restricted list of technical periodicals, which is seldom. The *Psychological Abstracts* has not listed them. The annual index of each journal which carries book reviews is probably the most reliable source up until 1951, when *Previews* appeared and included a guide to reviews. This index appeared to be thorough and accurate. Unfortunately, it ceased publication in 1952, according to unofficial information received early in 1953. It is hoped that something can be worked out to continue its functions, particularly the review index.

Evaluating textbooks for use in his courses is a special concern for the young instructor and is one of his first professional problems. Suggestions seem poor substitutes for experience: most older teachers ruefully recall some early unfortunate choices. At the least, the characteristics wanted in a text may be listed in relation to the course and student requirements. Viewpoint, coverage, level of presentation, documentation, readability, organization, format, and cost are typical criteria, mentioned roughly in the order of importance. For introductory texts one might add: availability of student manuals, instructors' manual, keyed teaching aids, keyed objective questions, and the like. A first-rate textbook unquestionably improves a course, but it can never substitute for first-rate teaching.

Purchasing Books. The student of psychology should begin early in planning and building his personal library. His teachers cringe when they learn that he has sold his text at the end of the semester for a small percentage of its eventual worth to him. Few students master the contents of a really good book in a semester's exposure.

Books are valuable personal assets to the scholar, to be purchased carefully and eliminated even more cautiously. Since the young psychologist often has limited funds for purchase and limited facilities for storage, and must anticipate frequent moving about, he should use discrimination in his library planning. Initially the core will be those books his teachers have selected as best for texts. He certainly should have a good psychological dictionary, such as Warren's. He will want to add other reference books and collections, then selected texts from a variety of psychological areas, and later significant books from his own area of specialization.

The qualified graduate assistant, the instructor, and the professor are often allowed a discount from list price by direct purchase from the publisher. Publishers vary in their practice of allowing desk copies to be sent gratis, but nearly always liberal free examination time is granted and the instructor is not required to pay for a book adopted as a text. Good-quality used books and sometimes valuable finds in out-of-print books can be picked up in small bookstores by those with time to browse. Names of some used-book dealers who have psychology listings are included with the publishers in Appendix C.

Library users will find that reference books are revised, improved, and expanded rather frequently. In addition, the scholar will eventually have a need for some unusual source material not covered in this chapter. For these reasons, we have included in the bibliography several source books to titles of reference books (A 22-24) familiar to the librarian and useful to the library researcher.

SUMMARY

It has been the purpose of the present chapter to take the reader on an inspection tour of the many widely scattered sources of library materials for which the psychologist may find a need. Although no one person is likely to make extensive use of all of these types in his professional career, it is possible that many students, teachers, and research workers may be able to broaden their acquaintance with library resources and thus increase their professional effectiveness.

Throughout this survey and the bibliography of Appendix A, there has been no rigid delimitation of the breadth of psychology for reasons pointed out in the first section of the chapter. Some

readers will find the various titles taking them well beyond their notion of useful materials, whereas others working on those fruitful problems between psychology and other disciplines may well wish for additional aids. For the benefit of the latter investigator, listings of library guides to the materials in cognate fields are included in Appendix A.

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CHAPTER 4

Bibliographic Problems in Psychology

In the preceding chapter emphasis was placed upon the scattered nature of psychological literature. This situation underscores the need for a knowledge of bibliographic aids in efficient literature search. "Psychology is one of the fortunate fields with adequate bibliographic tools," according to Shores (A 23, p. 300). This chapter provides identification and evaluation of the most useful digging tools and instruction toward a fuller mastery of their use.

BIBLIOGRAPHIC SOURCES

Index Guides

The index guide is a periodical which lists books, articles, and sometimes fiction. Typically each issue contains citations both by author and by topic within a single complete alphabetical listing. Publication is usually monthly, with cumulations appearing at specified intervals, for example, quarterly, semiannually, biannually, and every three, five, or ten years. Such a cumulative issue replaces all shorter-period issues within the cumulation, since all listings are recombined into a single new alphabetical listing.

Procedure in using the index issue is therefore to search by topic the most recent short-period issues, working backward in time to the progressively larger cumulations. By this stage of work, the searcher will have developed a reasonably good notion of which journals are likely to carry articles that interest him. Searching most recent issues of individual publications is a relatively easy task.

The instructions for use of each guide should be studied carefully. These usually can be found in each issue, or at least in the cumulative volumes. Individual citations have a structure different from

that usually employed by scientific journals, so those most familiar with the latter will need to note necessary changes.

General Subject Matter Guides. In this group are included those index periodicals which cover a wide range of subject matter, including that of psychological interest. Although all of the articles appearing in the psychological journals can be located more efficiently elsewhere, material of definite value can be found in the general guide with sufficient frequency to warrant familiarity with its use. As an example, the best, if not the only, reference to the Skinner Baby Box is easily located in the *Reader's Guide*, but is not listed in the guides to psychological literature. Obviously, the nature of the topic being searched will determine the degree to which general guides will be of use.

Poole's Index to Periodical Literature (A 29), edited by William F. Poole and William I. Fletcher, was published in 1886, covering the years 1802–1881. Five supplementary volumes for 1882 to 1906 were published from 1887 to 1908. There are nearly 600,000 articles from 470 American and English periodicals listed in one alphabetical subject index. This index may prove of value in special instances, although limited in its usefulness, since it is chiefly concerned with non-technical journals.

The *Reader's Guide to Periodical Literature* (A 30), which started in 1900, supplanted *Poole's Index* and is now probably the most important index to the general periodical literature. It is published monthly with cumulations at quarterly, annual, and longer intervals. The journals indexed are non-technical but for certain subjects, e.g., child care, education, and mental health, it is a guide to literature not ordinarily covered in psychological indexes.

In 1907 the *Reader's Guide* began the publication of a supplement with a similar cumulating policy. The title of this supplement was changed with Volume 3 (1920–1923) to the *International Index to Periodicals Devoted Chiefly to the Humanities and Sciences* (A 27). Volume 1 indexed only 74 periodicals but the number has been increased. The indexing is by subject and author only. Because the index covers most of the commoner psychological and educational journals as well as many in the biological sciences, it is of great value.

Annual Magazine Subject Index (A 25) emphasizes modern history, travel, and nature. It indexes periodicals not covered by other indexes, and includes all important articles in periodicals covered.

The first volume, in 1908, was entitled *Magazine Subject Index*, and subsequent annual volumes are supplements to this basic volume.

New York Times Index (A 28) is a valuable guide to news events of all kinds. Since major news articles appear at about the same time everywhere, the *Index* may be useful for other news publications. It is available in most libraries for the period beginning in 1913.

Special Subject Field Index Guides. A number of index guides are published for limited areas which are of importance for psychology. Those mentioned in the following paragraphs should be familiar and may frequently be of real value.

1. Science, general and collective

The Royal Society of London's *Catalogue of Scientific Papers 1800-1900* (A 58) is a comprehensive listing of scientific literature published in the nineteenth century. Entries are by author, with title, date, and reference being given. The series includes 29 volumes. Subject indexes for 17 fields were planned, but only those for mathematics, mechanics, and physics have appeared.

In continuation of this catalogue the *International Catalogue of Scientific Literature* (A 55) was started in 1901. This series was published annually for the period 1901 to 1914. Individual catalogues, giving virtually complete lists of all purely scientific books and papers published each year in the 25 countries of most importance scientifically, were issued for each of the following branches of science:

- | | |
|----------------|--------------------------|
| A. Mathematics | K. Paleontology |
| B. Mechanics | L. General Biology |
| C. Physics | M. Botany |
| D. Chemistry | N. Zoology |
| E. Astronomy | O. Human Anatomy |
| F. Meteorology | P. Physical Anthropology |
| G. Mineralogy | Q. Physiology |
| H. Geology | R. Bacteriology |
| J. Geography | |

The annual volume of each part contains an author index, a thorough subject index, and a schedule of classification in four languages. The list of source journals, published in 1903, includes some 4,670

titles. The sections of most value in psychology are those lettered L, N, O, P, and Q in the preceding list.

2. Medicine

Clinical medicine and the basic medical sciences are of great significance in many psychological specialties. Guides to medical literature are excellent. The U.S. Army Medical Library, with its unsurpassed collections, has long taken the lead in indexing medical literature. Starting in 1880, it published a detailed *Index Catalogue of the Surgeon General's Library* (A 88), which includes entries by author and subject. After publishing 57 volumes in four series, it was found impossible to continue this monumental work. However, to provide a continuing record of the collections, the *Current List of Medical Literature* (A 87), which began in 1941, was enlarged. Beginning with Volume 19, in 1950, this list appears monthly with detailed monthly and annual author and subject indexes. In its present form titles are listed in order of appearance in each issue of the journals indexed and the journal entries are arranged alphabetically by title.

The American Medical Association has published the *Quarterly Cumulated Index Medicus* (A 91) since 1927. This quarterly journal arranges its entries alphabetically by subject with cumulative and author indexes semiannually. Previous to 1927, there were two periodical medical indexes—*Index Medicus*, 1879–1927 (A 89) and *Quarterly Cumulative Index to Current Medical Literature*, 1916–1926 (A 90)—which were combined to form the present index.

3. Education

A separate index for the educational literature began in 1928. The first volume of the *Loyola Educational Index* (A 278) was published in that year in five numbers, cumulated in December. In 1929, this was superseded by the *Education Index* (A 276), which follows the plan of the *Reader's Guide*, having in one alphabet author and subject entries, and a similar cumulating policy. This index regularly lists articles from a number of psychological journals, as well as psychological articles from education journals. It has an excellent coverage of educational psychology, guidance, and child care and development. A very useful chapter on the use of this Index is given by Alexander and Burke (A 283).

For the field of vocational guidance there are two index guides. *Occupational Index* (A 233) lists a wide variety of material, including independently published pamphlets and leaflets on occupational information, which are often difficult to locate. Information on publisher, price, and contents are given. The annual index includes authors, subjects, and titles. The *Guidance Index* (A 231), which has appeared nine times a year since 1938, is directed to the needs of the person seeking information on vocational choices.

4. Miscellaneous

Three of the standard indexes in entirely separate fields contain considerable material of psychological interest. The *Industrial Arts Index* (A 296), which started in 1913, does not include any psychological titles in its list of journals indexed, but it does index psychological papers in other journals. Its chief importance for the psychologist is in the fields of industrial psychology, advertising, and so on. For these subjects it may list papers from the technical and engineering journals that would not find their way into regular psychological indexes.

Public Affairs Information Service (A 197) is a weekly published since 1915 with cumulations. This guide gives coverage of several areas of interest including social psychology, social welfare, public health, clinical psychology, and psychiatry.

Agriculture Index (A 195) shows extensive listings in child care and development, animal behavior, and some aspects of social psychology. Mention should also be made of the *Bibliography of Agriculture* (A 196), which, since 1942, has given exhaustive coverage of the world's agricultural literature, including material of psychological interest as mentioned for the *Agriculture Index*.

Psychological Index Guides. A few guides of this type, limited to the psychological literature, have existed in the past but have been largely superseded by the more useful abstract journal, to be discussed later.

Rand's *Bibliography of Philosophy, Psychology, and Cognate Subjects* (A 117) lists literature in those fields through 1902. One of the seven sections, of 275 pages, is devoted to psychology, and is the best single source to its nineteenth-century literature.

The *Psychological Index* (A 116) should be familiar to all psychologists. It was started as a supplement to the *Psychological Review* in

1894 and gives extensive coverage of all the literature of the science, including foreign, through 1936. Each annual volume lists citations in subject classifications, which change rather extensively from time to time. There is an alphabetical author index, but no subject index. There are about 3,000 titles per year, and about 350 periodicals are indexed. Starting as it did so early in the history of scientific psychology, this index is an invaluable record of the earliest literature.

Specific Journal Indexes. Almost all of the journals used in psychology publish, usually with the concluding number of each volume, some sort of list of the material published in that volume. These range from simple tables of contents, arranged in chronological order, to rather elaborate author and subject indexes, which are extremely valuable. These yearly or volume indexes have, of course, the limitation that they cover a relatively short period. Some journals have a policy of publishing comprehensive indexes for a long interval. Such indexes are seldom issued for fewer than five volumes and may cover fifty or more. The existence of such indexes for psychological journals is shown in Appendix B, and further information can be secured in the *Union List of Serials* and in Haskell's check list of cumulative indexes (A 10).

Dissertations and Theses. The *List of American Doctoral Dissertations* (A 21) was published by the Library of Congress annually between 1912 and 1938 and indexed by author, subject, and university. The *Bibliography of Research Studies in Education* (A 273), published annually between 1926 and 1940, lists and abstracts briefly M.A., Ph.D., and faculty studies within its scope of interest. *Dissertation Abstracts* (A 18) is a quarterly journal of abstracts of theses and monographs available on microfilm from University Microfilms. There is an annual cumulative index by title under subject classifications. The best source for later years is *Doctoral Dissertations Accepted by American Universities* (A 19), published by the H. W. Wilson Company since 1934. Although this guide depends upon reports from graduate schools for completion of listings, it appears to be reasonably complete. There is an author and subject index. Included is information on the availability of theses on interlibrary loan and a list of sources of dissertation abstracts. Psychology is placed with the biological sciences in the classification scheme. Palfrey and Coleman's *Guide to Bibliographies of Theses* (A 20) should be consulted for other sources.

Since 1949, *Psychological Abstracts* has listed by title both doctoral and masters' theses as they are submitted officially by university departments. What titles are to be submitted is decided by the department, and there must be assurance that they are available on interlibrary loan. Lists of dissertations of Canadian universities appear annually in the *Canadian Journal of Psychology* (B 59).

Abstract Guides

In addition to indexing the literature, the abstract type of aid provides a brief, non-critical summary of the contents of the article or book cited. In view of the many shortcomings of titles, such additions make the abstract journal much more useful than the index journal. Since it also increases the space necessary, a different structure is required.

Most abstract periodicals appear monthly. Topics are classified by a scheme generally accepted by the scientists being served, although the exact categories may change from time to time. These journals are seldom cumulated but are usually indexed annually. The quality of the index is the clue to the usefulness of the abstract guide, since, with a poor index or none at all, the user is forced to search departments issue by issue with no assurance that the editor and the user concur on the proper classification of an entry. None of these guides have provided anything comparable in usefulness to the three-, five- or ten-year index cumulations, so they must be searched by annual volume.

General Science and Technology Abstract Periodicals. The three to be listed here are published by U.S. governmental agencies. They offer perhaps more technological than scientific coverage, in the usual sense of the terms. To those psychologists with intimate knowledge of the vast amount of research (including basic psychological problems) conducted in military laboratories and on military contract during World War II and after, the usefulness of these guides will be readily apparent. An impressive amount of such research has now accumulated and will continue to be produced. Very little of it reaches the open distribution of the regular periodicals. Although much of the wartime research, and some since, has been unavailable for security reasons, a great deal was not classified or has been declassified. Such reports are usually reproduced by mimeographing, offset, or similar processes, and have limited distri-

bution. No satisfactory method has yet been devised to collect and abstract this widely scattered literature. Many omissions and large gaps are known to exist in the guides available. Probably the best source of information is an acquaintance with those psychologists active in such research.

Bibliography of Technical Reports (A 62) is published by the Office of Technical Services, U.S. Department of Commerce. Volume 1 begins with January 1946. The major purpose in establishing this periodical was to make available the foreign technical literature not distributed during the war, but it now carries abstracts of federally financed research reports which do not have security classification. In early volumes the psychologist must search widely for items of interest, especially in the "miscellaneous" category. Later a "psychology" category was introduced.

Technical Information Pilot (A 60) is published by the Library of Congress, under contract with the Office of Naval Research, in four series—unclassified, restricted, confidential, and secret—according to the nature of the works abstracted. Only the series corresponding to the security levels for which a person has been officially cleared may be made available to him. Unfortunately, titles which become declassified are not relisted in the unclassified section. Psychological references may be found in at least three of the alphabetical categories—J. Biological and medical sciences (basic); Y. Medical (applied); and Z. Personnel and training (applied).

Technical Data Digest (A 54) is published monthly by the Armed Services Technical Information Agency. Beginning in 1952, it was classified as *Restricted*, so now it is available only to those working on national defense research who have been properly qualified to use it. Abstracts of published technical articles are presented in a classification scheme developed by this agency. There is a category for psychology, and items of interest to psychologists will be found in several other sections as well. Indexes appear semiannually. The ASTIA also operates an index card service for all documents catalogued (including technical research reports), a bibliographical search service, and a library reference service. These extensive facilities are available only upon proper military security clearance. Psychologists who hold research contracts with a military agency may obtain further information by writing ASTIA, Dayton, Ohio.

Abstract Journals in Cognate Fields. A number of abstract peri-

odicals presently available in the sciences and in education may be useful to the psychologist engaged in library research. Borrowing of literature from other fields will surely be facilitated by greater acquaintance with these guides. The importance of cross-science fertilization has been frequently emphasized, and it is a common observation that the most challenging frontiers lie in those neglected areas between the sciences. It should also be noted in this connection that psychologists do not confine their publishing to the psychological literature, so the guides to cognate subjects may at times be the best source for such works.

Interscience and international exchange of scientific information has come within the active field of interest of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Possibilities of extending such services was the topic of a planning conference of experts and an official full-scale conference in 1949 (15). The 30 specific recommendations coming from this conference emphasized facilitation of the work of existing agencies for abstracting, rather than supplanting them with any single, all-inclusive organization.

Many national and international bibliographic groups are concerned about the chaotic condition which prevails in scientific documentation and dissemination. Bradford (4) has surveyed the problem and developed a suggested plan for its solution, involving co-operative exchange by the various abstracting services. He has developed an interesting "law of scattering" (see Chapter 3) to show why abstract guides cannot possibly be complete in their coverage of the literature.

The following list of abstract guides in related areas is not exhaustive, but does include those journals found to be of greatest value to psychologists.

Educational Abstracts (A 274) had a brief history, covering the period 1936-1944 only. Material is classified into 24 divisions. Since there is no title or subject index, search must be made month by month. Use of the *Education Index* is preferable, unless one is seeking an abstract of the work of a particular known author.

Loyola Educational Digest (A 277) was published monthly between 1924 and 1943 with extensive abstracts printed on 5 x 8 cards. A descriptive title and Dewey Decimal Classification number was given to each card. Equipment necessary for filing the cards and to

provide for personal expansion of the file were made available. The year's collection of cards were issued as a bound pamphlet at the end of each year.

Philosophic Abstracts (A 125) has appeared quarterly since 1939. Books are abstracted, but periodical literature is merely indexed. Classification is by country of origin. There is no index. An annual bibliography appeared in each August issue of the *Journal of Philosophy*, 1934-1937. Several unsuccessful attempts have been made to give philosophy more complete bibliographic tools.

Abstract guides in the social sciences have likewise had poor success. The *Social Science Abstracts* (A 198) cover the period 1929-1932 only. The great volume of material is one of the chief sources of difficulty in this area. In 1949 a research project was financed by the Carnegie Corporation (3) to investigate the possibility of providing such a service for at least a portion of the social sciences.

Physiological Abstracts (A 95) gives the user efficient access to the literature of that subject for the period beginning in 1916 and ending with its amalgamation with the *British Abstracts* (A 93) in 1936. Articles in physiological psychology appearing in the physiology journals are included.

Child Development Abstracts and Bibliography (A 184) includes articles on physical and mental health areas, as well as environmental factors, education, growth, heredity, social welfare, and psychological development of the child. It is published in six issues per annum and is indexed by author and subject. Critical reviews of books, both about and for children, are included in a separate section of each issue.

The Kodak Monthly Abstract Bulletin (A 56) covers the field of photography—amateur, professional, and technical. Psychologists who use photography as an experimental tool or who are interested in educational film production will find this guide of value. A number of articles on visual perception, especially color perception, are included and are classified in the section on physics. The *Bulletin* is not indexed. It was first published in 1914. *Ophthalmic Literature* (A 165a) should also be consulted for abstracts of studies on visual perception.

Excerpta Medica (A 94) is a "comprehensive abstracting service of the world medical literature," clinical and theoretical. Abstracts are in English, but the aim is to present "pertinent and reliable ab-

stracts . . . of every article appearing in every available medical journal in the world." First appearing in 1947-1948, it seems to have made a creditable start toward fulfilling that prepublication aim. This vast literature is abstracted each month in a series of 15 separate journals (sections), with subscription by individual journals. Of interest to psychologists are the following topics, with the section numbers indicated in parentheses: physical anthropology (I), physiology (II), clinical endocrinology (III), public health (IV), pediatrics (VII), neurology and psychiatry (including many important areas of psychology) (VIII). Since all the division headings are interpreted very broadly, psychologists should scan this journal carefully. In actual practice, they will pick up mostly such articles as are published in medical or medically oriented journals.

Biological Abstracts (A 92) also embraces a wide field of literature with emphasis upon basic and theoretical work. By 1945 monthly volumes became too bulky for efficient use, and division was made into five sections published as separates. Psychologists will find Section H, *Human Biology*, of most interest, since it covers heredity, population, embryology, child development, adolescence, growth, nutritional disorders, food habits and appetites, senescence, endocrine bases of behavior, reproduction and sex, ecology, race, and other problems of human biology in a wide sense. Section B, *Basic Medical Sciences*, is also of importance to psychology.

Industrial Training Abstracts (A 297), first published in 1946, includes abstracts of research and descriptive literature of worker and supervisor training, training methods and evaluation, personnel relations and training, and related personnel methods.

Abstract Guides in Psychology. Although this group is dominated by the *Psychological Abstracts*, a few other titles will be described briefly.

Psychological Index Abstract References (A 123) is a two-volume guide to the sources where abstracts of listings in the *Psychological Index* may be found. Searching the literature and publishing the *References* in 1940-1941 was a joint project of the Works Progress Administration and the American Psychological Association. Unfortunately, a great many of the abstract sources are just as inaccessible as the original articles. The condition of copies we have seen of these books in libraries testifies to the fact that they are little used. A much greater service to the profession would have been performed

had the project completed the *Comprehensive Index*, as described in detail by Poffenberger (10). The *Abstract References* was a sub-project, but was the only portion to reach completion.

The *Psychological Bulletin* (B 210) included a limited number of abstracts of the literature in psychology in the period 1921–1927. This gave rise to the establishment by the APA of a separate abstracting journal to serve the profession.

L'Année psychologique (A 122) (1894—) and *Zeitschrift für Psychologie* (B 328) (1890–1941?) should be consulted for selected abstracts to the European psychological literature. In both cases the abstracts are presented as a section within a standard journal format. Not all volumes of the *Année* include this feature.

Psychological Abstracts (A 126) since 1927 has been the most significant literature research tool available to the psychologist. In delineating the policy of the journal in 1947, Louttit summarized the position which this periodical has deservedly earned:

Generally it will be agreed that *Psychological Abstracts* is intended to be a current, yet permanent, record of the literature of psychology covered with the greatest possible completeness. Dr. J. Brožek, in a personal letter, succinctly sums up a significant *de facto* function of this journal: "*Psychological Abstracts* have become . . . the standard bibliographical reference source, and the material included delimits the confines of the literary universe for the majority of American psychologists." This quotation, which expresses a thought shared by others, presents a definite challenge in the formulation of policy (8).

Curious as to the extent to which Brozek's statement could be applied, Daniel directed a graduate class in an investigation of the degree to which literature cited by productive psychologists was actually to be found in the *Abstracts*. For the typically experimentally oriented psychological journals, the percentage of *Psychological Abstracts* inclusion of articles cited has continuously been high—around 90 per cent. For the applied journals, the figure has gradually been raised over the years from around 50 per cent to about 90 per cent. These figures were interpreted to mean that the journal is giving satisfactory coverage and has developed to keep pace with the changing character of American psychology.

Of perhaps greater interest to those concerned with bibliographic research is the nature of articles not covered by the *Abstracts*. Re-

turning to the "policies" article of Louttit (8), we find discussion of four types of literature which are included in the *Abstracts* in decreasing proportion: (a) specifically psychological, (b) psychological contributions from related fields, (c) material with psychological significance from borderline fields, and (d) background material of specific value. The great majority of the omissions (i.e., citations used in the literature, but not found in the *Abstracts*) fall into the last-named category, although there would of course be an irreducible number from other groups. Such citations as "unpublished reports," "private correspondence," "unpublished theses," and the like tend to reduce the percentage. It will be obvious to the reader familiar with bibliographic problems that full coverage of background material would be financially prohibitive and would clutter the journal to such a degree as to render it less, rather than more, useful. One of the chief problems of editorial policy is where to place the inclusion-exclusion limit within group (d).

In view of Bradford's discussion (4) of scattering, previously mentioned, probably the greatest improvement of the *Abstracts* could best be implemented by users themselves. A large number of journals are regularly searched for psychological articles (490 in 1951). It is the infrequent but sometimes significant article published elsewhere which escapes editorial or reviewer notice. What this means is that, in order to reach absolutely full coverage, a tremendously large number of journals would have to be searched, most of which would provide an article a year, or less. "Abstracting services concentrate upon the comparatively few periodicals where many articles in the subject may be expected," Bradford points out, "and ignore the very large remainder where the frequency of the articles is far less, but the aggregate of articles is greater. It would be impracticable for them to do otherwise" (4, p. 123). Abstracts of such articles are welcomed from authors or readers, whether or not the person is a regular abstractor.

The *Psychological Abstracts* appeared for many years in 13 issues per year—12 monthly content issues followed by an index issue. In 1952 the twelfth issue (December) became the index issue. Each abstract bears an item number and subject indexing is by this number. Items are arranged alphabetically by author within subject matter classes and subclasses (see Chapter 5). The number of subject divisions has gradually been increased, although the major categories

remain remarkably similar to those in early volumes. There is a monthly author index, and annual author and subject indexes.

The Bibliography Index

An index to bibliographies is in one sense closely related to the index guides discussed earlier. Its inclusion here, following abstract guides, is in recognition of the fact that at its best the bibliography index can reveal to the user a reasonably complete picture of the literature in his subject with very little search. Unfortunately, not all the guides are of this quality.

General Bibliography Indexes. These guides are structured, and may be used, in much the same way as other standard indexes. However, in the latter case there is no question as to what constitutes a *citation*. What makes a bibliography is a matter of more or less arbitrary definition, and the two guides included here offer greatly contrasting solutions to the question.

A World Bibliography of Bibliographies (A 31), edited by T. Besterman, lists only separately published bibliographies. Only about 30 psychological items are listed under the word psychology, but many more are to be found under special topic rubrics.

The *Bibliographic Index* (A 32) is another of the many reference periodicals published by H. W. Wilson. This is a quarterly, appearing since 1937, with annual and four-year cumulations. Page references in the citations are to bibliographies only—not to the whole article of which the bibliography is only a part. Some of the items of psychological interest seem to be misclassified, and in some cases as few as six citations in an article qualify it as a bibliography. A feature of the listings under each topic heading is the use of the asterisk indicating “first purchase” or preferred items. An inspection of Volume 1 disclosed about 350 references under psychological topics, with probably as many more under specific topic headings other than psychology but still of primary interest. Although a psychologist could produce a more generally useful guide to the published bibliographies in the field, the *Index* is of much value. A number of the prominent psychological journals are regularly covered.

Bibliography Indexes in Psychology. No very recent inclusive guide to bibliographies in the field of psychology exists. One important earlier source will be discussed in some detail, followed by a number of other suggestions.

A *Bibliography of Bibliographies in Psychology, 1900-1927* (A 112) was compiled by Louttit in 1928. This is a bibliography of 2,134 bibliographies, listed alphabetically by author and comprehensively indexed by subject. A detailed search of all volumes of 144 journals published in the period covered furnished the bulk of the entries; about 20 per cent were books and miscellaneous publications.

The definition of a bibliography decided upon as a criterion for inclusion was neither as limited as that used by the *World Bibliography* nor as inexact as that apparently in use by the *Bibliography Index*. Any item to be listed had to meet one of three requirements: (a) include 50 or more references, (b) be reasonably complete for the subject indicated by the title, or (c) be attached to a historical review or summary. A small number of items meeting these criteria only marginally were included. This gave a comprehensive list of the most important bibliographies published during the first quarter century. Its value as an efficient source for that literature is obvious. Unfortunately, no one maintained such a service and the task today of professional searching and clerical compilation of the literature since 1927 would be even more staggering than was Louttit's.

Students and others sometimes overlook the possibility of searching under "bibliographies" in annual indexes of the *Psychological Abstracts*. A definition of bibliography similar to that just mentioned is currently employed as a criterion for inclusion under this topic of the index, and sublisting is, of course, alphabetical by subject.

Some university or departmental libraries maintain a file of bibliographies of general usefulness. For maximum value there should be an adequate index with generous cross-listings.

The Literature Summary

Closely related to the bibliography is the article or book which summarizes in a very brief and often non-critical manner the significant literature of the field. In fact, a reasonably comprehensive bibliography is an integral part of such a report. These must still be considered as guides to the literature, although they border upon and merge into such literary forms as the compilation, the reference book, the handbook, and the textbook, all of which are discussed elsewhere. The literature summary is widely used as a means of

keeping up with areas of the science not directly related to one's specialty.

The literature summary is always restricted in some way—by period, by topic, or by both. There is considerable variation in the treatment given to the articles cited. On the one hand, it may be little more than an annotated bibliography with continuity. The other extreme has no fixed limit, examples merging gradually into the integrated critical discussion with infrequent citation breaks that marks the style of the well-written text.

Psychological Bulletin (B 210) articles are for the most part summaries of the literature rather than reports of original research such as is found in most of the other journals. Critical evaluation, integration, and considerable contribution by the writer by way of synthesizing a major problem characterizes *Bulletin* articles, although, of course, these functions are not performed to the same degree by all writers. Bibliographies are usually lengthy, comprehensive, and useful. Articles of this type will sometimes find their way into other journals, but the *Bulletin* has come to have that major function in the family of psychological journals.

The *Annual Review of Psychology* (A 155), which began with the 1949 volume, is perhaps most typical of this type of literature guide. Each chapter is written by a different specialist. The objective is to cover new developments in each of many currently active fields of psychology during the year or since the topic was last reviewed. Different authors contribute different degrees of criticalness, integration, and evaluation, but the emphasis is less upon these features than upon coverage. Bibliographic style in early issues follows that of the *Annual Reviews* in other sciences, which is somewhat unfortunate since it is not the style most popular in psychology. Those interested in physiological psychology should be familiar with the chapter on that topic appearing for many years in the *Annual Review of Physiology* (A 105).

The *Review of Educational Research* (A 279) serves a function similar to that of the *Psychological Bulletin*. Each issue is devoted to a general topic in education and the topics reappear in approximately three-year cycles. Such pertinent psychological subjects as educational psychology, tests and measurements, and child development are reviewed.

Concluding Statement on Bibliographic Guides

In this first part of the chapter an attempt has been made to review and evaluate those aids which have proven of greatest usefulness to the scholarly psychologist in his search through the vast and scattered literature of the science. In general, the transition has been from the less useful to the more useful, section by section, and from general to specific within a section. An item is not necessarily superior to another following it in a different section, and the organization will obviously not hold for all purposes or personal preferences.

The reader especially concerned with the literature search problem may wish to consult the basic library guides to reference works. The *Guide to Reference Books* (A 24), originally compiled by Mudge but in its latest revision the work of Winchell, has been the standard librarian's tool for many years. In this book will be found a short but very good set of suggestions for examining and using reference works. Shores' *Basic Reference Books* (A 23) is designed as a textbook for the reference librarian. Its critical evaluations, descriptions, and discussions are helpful to the library user as well. It gives a selected rather than a comprehensive coverage. Hirshberg's *Subject Guide to Reference Books* (A 22) features a well-planned and adequately indexed listing of a number of selected subject areas. Two library journals, *Special Libraries* (13) and the *Journal of Documentation* (6), frequently carry articles pertaining to the scientist's bibliographic problems.

The exhaustively detailed work of Alexander and Burke (A 283) deserves special mention here. This book parallels the present chapter (and a few others) for students in education. Since many research practices in the two fields are similar, the reader is advised to study their Part I in particular.

THE CONSTRUCTION OF A BIBLIOGRAPHY

Active use and mastery of the bibliographic tools just described may be for informal self-instruction or for seeking information on an isolated point. More frequently the objective is the construction of a formal bibliography on a topic of concern to the researcher. For the student and scholar the bibliography in turn becomes a first-hand

entry to the content of the literature. It follows, then, that the construction of a bibliography is an important link in the process of professional maturation for the student, and of specialization for the professional. This portion of the chapter will consider in detail bibliographies and bibliographic form.

In published form the bibliography serves a number of additional functions. As commonly employed in scientific writing, bibliographic citations document the statements and interpretations which form the background and setting for the paper. In scientific reporting this kind of "evidence" is as vital to the acceptance as is information on research data and its accumulation. The second function, then, is to give the reader sufficient information so that he may easily locate and examine for himself that same citation.

Still another purpose is that of serving the unknown worker who in the future may push a problem beyond the development afforded in the article we are now considering. He should be able, by inspection of a bibliography, to cull and evaluate, seeking further what he will. In short, the productive psychologist has a duty, it would seem, to pass on to others the fruits of his library research as well as his laboratory research. In summary, a bibliography is three things, functionally speaking: (a) the key to literature acquaintance, (b) documentation, and (c) a service to the science.

Thus far we have been using the term *bibliography* rather informally and inexactly. Let us now specify some meanings for clarity throughout the remaining discussion. We suggest that the term *citation* be used to refer to the identification of a single journal article, monograph, pamphlet, book, or other separate which is listed and described by author, title, and location. A number of citations grouped together in a logical order is a *bibliography* if in some described way it represents a coverage of the topic in question. It is a list of *references* if it includes no more than the citations referred to in the text and there is no effort at comprehensive coverage of the topic. It is a *reading list* if it consists of citations selected by the writer for further information but not referred to.

Whichever type of citation list one employs, he should be sure that the caption is correctly selected. It is annoying to find a reference list identified as a bibliography, and, indeed, the practice borders upon the unethical. Nor is a reading list, however broad the choice of items, properly termed a bibliography. Even more impor-

tant is the elimination of errors in the citations and in their order. Such errors are considerably more numerous here than in any other part of a scientific report. In a recent study (Ref. 3, Chap. 3) it was estimated that one out of every 20 citations contained an error of some kind. Anderson and Valentine (1) report that in a single *Psychological Bulletin* article, 323 corrections were necessary in the bibliography. Such carelessness would not be tolerated in the research; it should not be tolerated in the research report.

Many guides have been published to aid in the proper construction of a bibliography. Most of the more general style books contain chapters or sections on the topic. It is unfortunate that no standardization exists, at least for the sciences. Ellis (5) has pointed up the need for standardization and he notes that "Among thirty-seven scientific publications that might accept [a certain ms] for publication, there are no less than twenty-nine ways of citing the bibliographical material."

In the past there has been no uniform policy for APA journals. Anderson and Valentine (1) suggested a style, but an examination of the APA journals showed only two using precisely the same form. This situation should be corrected by the *Publications Manual* (A 159), prepared by the APA Council of Editors in 1952.

Kinds of Bibliographies

The General Bibliography. This is a dubious or at best a theoretical type, since it is not sufficiently limited to be useful or else it is more properly described as a selected reading list. At the date of publication of Rand's *Bibliography*, a general bibliography of psychology was conceivable. By now such a list would be prohibitively lengthy.

The Universal Bibliography. This type is limited by topic only. If it is truly universal, it is not limited by time or nationality. The narrowness of the topic is not a consideration, however. One might construct a universal bibliography on an obscure topic and finish with very few citations.

The Selected Bibliography. If a narrowing of selection is made in the search on the basis of time, nationality, language, journals inspected, or most preferred items, then the bibliography is selected. In such a case the heading should indicate the criterion of selection.

The Classified Bibliography. Formal literary bibliographies are

often classified by the type of document cited, with a separate heading for each type. In scientific reporting the classified bibliography is less often employed, and almost never is this particular criterion used. Sometimes, if the bibliography is long, it may be classified by subtopic or some other scheme more meaningful to the scientific purpose.

The Annotated Bibliography. When brief descriptive sentences follow each citation, the bibliography is said to be annotated. Such notes should not be confused with abstracts or summaries. Rather, the notes interpret or expand the title, offer concise evaluation, or relate the citation to other citations. This is one of the most useful kinds if made by someone familiar with the topic.

The Working Bibliography. Any bibliography short of completion may be considered a working bibliography. More explicitly the term refers to informal bibliographies where each citation is on a separate piece of paper, i.e., order has not yet been determined. We shall discuss this step in greater detail in a later section.

Techniques of Ordering the Citations

General Treatment. In its final form, the bibliography consists of citations arranged alphabetically by author's surname. A single alphabet is greatly preferred in scientific reporting. This merely means that all of the "A"s are found at the beginning, followed by all of the "B"s, and so forth. There are no repetitions of the alphabet unless a classified bibliography is employed. Preceding the surname and separated from it by a period and a space is a number. Assignment of numbers is, of course, determined by the alphabetical position. A single sequence is used, and ordinarily no number is used more than once. If a last minute addition must be made after numbers have been assigned to items and the text reference numbers entered, then the new citation is placed in its proper alphabetical position. The number assigned to it is the same number as used for the citation just preceding, except that the letter *a* is added to that number for the new citation.

Alphabetizing. It would seem that the task of arranging in alphabetical order would be so simple as to make further discussion contraindicated. Yet idiosyncrasies of the alphabet and insidious errors may trip even the expert. Material may be considered letter by letter or word by word. In the former case, "Smith, S. R." would

follow "Smithman, S. R." In the latter case, which is preferred in library work and in bibliographies, "Smith" would precede his colleague "Smithman." This is based upon the argument that "nothing precedes something." Thus the "nothingness" of the space following "Smith" gives it precedence over all "Smith[somethings]." Of course, "Smith, S. R." precedes "Smith, S. W.," which in turn precedes "Smith, T. A." "Smith, Sally" would fall between the last two named. This simply illustrates the point that when initials alone are used they must each be considered as a whole name, even though the correct given name is known. The hyphen in a compound name is not considered as a "nothing," i.e., the compound name is considered as a single name.

Surnames with prefixes present special problems. Names beginning with *M'* or *Mc* should be alphabetized as though spelled *Mac*; *St.* and *Ste.* are listed as though spelled out, i.e., *Saint* or *Sainte*. Article and preposition prefixes (*de*, *la*, *du*, *von*, *van der*, *della*, and so on) govern alphabetical position in accordance with different rules for different languages. The problem is treated in detail in the *A.L.A. Cataloging Rules* (2). The APA Council of Editors (A 159) has agreed that, inasmuch as the prefix in Anglicized usage is commonly spoken as part of the surname, alphabetization will be according to the prefix in all cases. Umlaut letters (e.g., German *ö* or *ü*) are alphabetized as though spelled *oe* or *ue*. Letters not appearing in the English alphabet (e.g., Danish *ø* or Spanish double letters *ch*, *ll*, or *ñ*) may be treated as accented variants of the single letter.

When an author's name does not appear on the article or book cited but is known to the bibliographer, he may report it and list accordingly. To indicate this operation, the name is enclosed in square brackets. If the citation cannot be credited to a personal author, but is the work of a committee, board, institute, bureau, department, or other organization, it should be listed as by a corporate author. Details of such corporate authors are given by Louttit (9). We do not recommend listing such entries, or items having no author, in a separate alphabet by the first word of the title as is sometimes done. Corporate authors are arranged in proper alphabetical order with personal authors. Citations specifically signed "Anonymous" are arranged as if that word were a pseudonym, and so alphabetized with personal author names. In the few cases for which there is neither a personal nor a corporate author, we prefer

to alphabetize by title in the same alphabet with authors rather than in a separate alphabet at the end of the listing.

Special Problems. When a citation is credited to more than one author, the first-named determines the alphabetical position. However, all citations by any particular author alone precede all citations of which that same author is the first-named in multiple authorship citations. Here again, the "nothingness" of having no second author takes precedence over an actual second author.

When there is more than one citation to a particular author (or to the same group of authors), determination of sequence is made by year of publication, with the oldest appearing first. No finer determination of chronological sequence may be considered, even if known. When this situation exists for citations dated within the same calendar year, the first significant word of the title determines the position alphabetically. In any case of multiple citation to the same author, each citation should show his name as the first entry.

Techniques of Structuring the Citation

In the typical citation there are three major parts; the author, the title, and the location. Each part is terminated by a period, and a double space precedes the start of the next one. Qualifications or explanations of an entry are abbreviated and appear in parentheses just preceding the terminal period.

Author. The surname appears first, exactly as given in the article or book cited. It is followed by a comma and a space. In the case of male authors, given names are usually indicated by initials. (An optional practice is to spell out the given name.) A period follows each initial and the two initials are separated by one space. The period after the final initial does the double duty of indicating that it is an initial and of terminating the entry. For female authors, the first or preferred given name should be spelled out and followed (or preceded) by the proper initial and period. This system of initials for men and names for women is of considerable help to the bibliography user who is not personally acquainted with those he quotes, in avoiding miscalling of the sex, and at the same time it helps reduce citation length.

Multiple authorship is indicated by listing the authors in the same sequence as is found in the original. Each author's surname precedes his given initials (or name) even though this name may not

enter into position determination. After the last initial and period of the first author, there follows a comma, a space, the ampersand (&), another space, and the name of the second author. If there are three authors, the ampersand stands between the last two only, the others being separated by commas and spaces. With four or more authors, only the first author is named and the words *et al.* are substituted for all the secondary authors. This practice is optional for three authors.

Some of the common author qualifications are (ed.), (chm.), and (comp.). These indicate that the named person is editor, chairman, or compiler, as the case may be. Note that the period inside the parentheses indicates the abbreviation and another must be used outside to terminate the entry.

Title. The title wording and punctuation within the title should appear exactly as found in the work cited. The shortened running head, often found on pages following the initial page or title page, should not be used. Capitalization is confined to the first letter of the first word, proper nouns, the first-personal pronoun, German nouns, and the Deity. No quotation marks, underlining, or italics are used in the title of an article unless such are found in the original for a single word or phrase. Journal article titles which involve a series title followed by a numbered part title must be given in full.

Book titles are presented in the same way as article titles except that they are underlined continuously in the typewritten manuscript. In letterpress form the titles are italicized. Subtitles of books are usually omitted in citations. When citations are to a single chapter of a book which credits particular chapters to particular authors, the author entry is to the chapter author. The title entry begins with the chapter title in the form of a journal article title. This is followed by a period, a space, and the word "In." Following this without separating punctuation is the full citation to the book appearing just as it would if the whole book were the citation.

Titles in any language using the Roman alphabet (e.g., English, German, French, Spanish) should be presented as they appear in the original. No translation is given. The *Psychological Abstracts* departure from this rule is a special service to readers and is not meant to be a guide to standard bibliographic form. Titles in languages using non-Roman alphabets (e.g., Japanese, Chinese, Russian) should be transliterated according to a standard system into

the Roman alphabet. An alternate method is to translate such titles into English and enclose them in square brackets. Qualifying indications, such as "2nd ed.," "Vol. 1," "Translated by . . .," usually follow the title, sometimes enclosed in parentheses.

Location. There are four items in the usual journal article location entry: name of journal, year, volume number, and inclusive paging. Each of these items is separated from the next by a comma and a space, and again the entry is terminated by a period. A hyphen (or, in letterpress, an en dash) but no space separates the two numbers necessary for the last item.

Journal names are always abbreviated according to standard form. Rules for proper abbreviation have been summarized by Louttit (8) from the 1930 code of the International Institute of Intellectual Cooperation (7). It is probably easier for all but the most prolific bibliographer to consult published lists of accepted abbreviations (e.g., 8, A 159, or Appendix D), although memorizing the major principles of the system will save considerable time. The journal name item is underscored continuously in the typewritten manuscript and italicized in the printed article.

All numerals are in Arabic. No special marking is given the volume number, although some editors will mark it for boldface type when printed. In the case of a periodical which pages each issue independently, the issue number can be indicated in parentheses immediately following the volume number, e.g., 7 (3), meaning volume 7, issue number 3. Occasionally three or more numbers will be needed to indicate the paging. Suppose, for example, an article appears continuously from pages 24 through 29, then breaks over to page 37 for completion, with unrelated material on pages 30-36. The proper indication of the pages item would be 24-29; 37. The hyphen indicates continuity, the semicolon discontinuity. The same system may be used for an article appearing in several parts but in the same volume of a journal.

The location entry (or imprint) of a book citation is somewhat different. The three items are: city where published, name of publisher, date of publication (year only). The first two items are separated by a colon and a space, the last two by a comma and a space. The city of publication is the home office of the publisher. If several offices are maintained, the home office will be the first listed at the bottom of the book's title page. If this is a well-known city

(e.g., New York, Philadelphia, Chicago, Boston, London, Paris), the name of the state or country is not given. Otherwise the abbreviated form of the state or country follows the name of the city with the usual punctuation between. Both the period and the colon follow an abbreviated state name. Names of well-known publishers are given in familiar or abbreviated form (e.g., Prentice-Hall, Harpers, Macmillan), but less well known names must be reported by the full official name. The date usually follows the publisher's name, separated by a comma. Ordinarily pages are not indicated, although this may be desirable in certain types of bibliography. Such indication may be by the last page number only (e.g., 740 p.), or by a combination of the pages of preliminary matter, usually in Roman numerals, and the last page (e.g., xi, 450 p.). In the case of a multi-volume work, the number of volumes should always be indicated following the period after the date. Citations to full volumes of journals follow the form of the book citation. Here, a dash following the date indicates the date of Volume 1 and that the series is continuing. A broken series or discontinued journal will be shown by inclusive dates.

The final items in a citation to a monograph follow the same form as for any other periodical if the journal in question practices continuous pagination throughout an annual volume. If each monograph is paged separately, then only the year and the monograph number are shown, thus: 1950, No. 7.

Qualifications of the entire citation should be presented following the final period. Although the practice should be discouraged, it is sometimes necessary to include a citation to an article which has not been examined in the original. If the abstract from the *Psychological Abstracts* (or similar journal) has been the sole or principal source of information about the contents, then parenthetical credit should be given, as for example: (source: *Psychol. Abstr.*, 1948, 22, 5613). Numerals indicate the year, the volume number, and the abstract number, respectively. If the source used is not conveniently referred to in this manner, the notation should be simply: (original not seen).

Simplified Citation Form. Many suggestions have been made to condense and simplify the individual citation, and some of these have been put into practice. Inevitably the result is a loss of what we consider to be an important and useful item. The most extreme example is the complete omission of the title—a practice followed in

early German literature and in certain subject fields, notably physics and chemistry. The possibility of confusion is clear. This is a frank attempt to serve only the second-mentioned function of the citation (see page 84) and that rather inadequately. It is to be hoped that this will not become a trend, since there is a lot of loss in usefulness for a very small gain in available space.

A form found in many textbooks does not result in any greater conciseness, but does increase the clarity and information in the text itself. Instead of referring to citations by number, the author and date are used. In the citation, the date is moved up to a position just following the author's name. When there are two or more citations to the same author and year, the date is followed by an identifying letter of the alphabet. The system is not now being practiced by any of the psychological journals.

Regardless of the annoyances resulting from the wide variations, it is necessary that an author conform to the bibliographic form practiced by the journal or publisher for which he writes. Therefore, for a paper which is to be submitted to a certain journal, the author should examine copies of the journal to learn the form of bibliographic citation employed and make his manuscript conform.

Search Methods

At its easiest, the compilation of a bibliography is the same tedious, exacting job as is laboratory research. Fortunately for the "scientific temperament," the task is just as rewarding. Some aspects are in the nature of clerical work, and indeed much of it can be accomplished more efficiently by a skilled clerical worker. Inevitably the burden of searching and culling falls upon the scientist, however. Certain techniques should speed the job and improve both accuracy and thoroughness.

Preparation. As with many complex tasks, adequate preparation and forethought are tremendously worthwhile in bibliographic search. The student who goes to the stacks in his library with an uncrystallized idea is unlikely to emerge from the maze any the wiser than when he entered. The nature of the topic dictates very clearly the proper initial approach. For example, a highly specialized and only recently explored subject is not likely to be found in the card catalogue; a strictly psychological subject search should obviously begin in the psychological guides; and an overview or "pre-

ferred item" bibliography can usually be located already assembled. Ineffective effort will be expended if the character, the purpose, and the scope of the search are not carefully considered beforehand.

The mere accumulation of references does not signify satisfactory bibliographic effort. An experienced library researcher approaches the problem *systematically* to insure adequate coverage. No specific system works equally well for every worker or every problem. There is a certain art involved, to be sure. Crane and Patterson (*A* 64, pp. 221-230) present an interesting variety of personal testimonials from chemists on their favorite systems. The picture could be duplicated among psychologists. Rather than hazard an account of *the* system, let us consider *a* system, with the recommendation that the beginner start here and develop his own variations. The practicing psychologist may find one or more of the ideas here an improvement on his own system.

A Suggested System. If the generality or history of the topic warrants, a good starting place is the literature summary—be it textbook, encyclopedia, or review article. Indeed, this helps to specify the problem and give the worker a "feel" for his task. Next, a bibliography on the topic should be sought. For most purposes—and certainly at this early stage—it may be assumed to suffice as adequate coverage up to the time of its preparation. In the absence of a published bibliography, the "high spot" or "major item" bibliography can be made quickly from one or two sources and will give perspective for the larger task.

A knowledge of the nature of the aids discussed in the first part of this chapter will lead to quick selection of those most likely to be profitable for a given topic. Figure 6 summarizes the most important reference aids discussed earlier. Organization is by major psychological category following divisions now used by the *Abstracts*. Periods covered are shown as an aid in evaluation for use in any particular search job. It would be well to make a list for each new search task, ranking the guides in the order of their probable usefulness for the topic. Continue down the list until no further material is uncovered, then go a bit farther to be sure.

For the search proper, the guides must be inspected systematically with great care. A popular method is to work backward in time, beginning with the most recent number or volume available. Again, when the returns begin to become sparse, it is time to try something

No.	Classification	19th Cent.	1900	1910	1920	1930	1940	1950	Continuing
1	GENERAL PSYCHOLOGY (including all categories below)	—Rand—					—Psychol. Abst.—		
					—Psychol. Index—				
					—Bib. of Bibs. in Psy.—				
					—L'Année Psychologique—				
					—Zeitschrift für Psychologie—		?	—Tech. I. P.—	
					—Cat. Sci. Pap. & Int. Cat. Sci. Lit.—			—Bibliog. Tech. Rpts.—	
					—Poole's—			—Bibliog. Index—	
						J. Phil.—		—Phil. Abst.—	
						—International Index—			
						—Reader's Guide—			
						—New York Times Index—			
2	PHYSIOLOGICAL PSYCHOLOGY						—Biological Abstracts—		
						—Physiol. Abst.—		—Exc. Med.—	
						—Index Medicus—			
							—Index Catalogue & Current List Med. Lit.—		
3	RECEPTIVE & PERCEPTUAL							—Ophth. Lit.—	
							—Kodak Monthly Abst. Bull.—		
4	RESPONSE				(See class 2.)				
5	COMPLEX				(See classes 1 and 10.)				
6	DEVELOPMENTAL					—Agriculture Index—			
						—Child Dev. Abst.—			
					(See class 10.)				
7	SOCIAL					—Public Affairs Info. Serv.—			
						—Soc. Sci. Abst.—			
					(See class 6.)				
8	CLINICAL, GUIDANCE, COUNSELING						—Occupation Index—		
							—Guidance Index—		
					(See classes 2 and 6.)				
9	BEHAVIOR DEVIATIONS				(See class 2.)				
10	EDUCATIONAL PSYCHOLOGY					—Education Index—			
						—Loyola Educ. Dig.—		—Ed. Abs.—	
					(See class 6.)				
11	PERSONNEL PSYCHOLOGY				(See classes 7 and 8.)				
12	INDUSTRIAL & APPLICATIONS						—Industrial Arts Index—		
							—Ind. Tr. Abs.—		
13	THESES							—Dis. Ac. by A. U.—	

FIGURE 6. Summary checklist of selected literature guides arranged according to divisions of psychology used by Psychological Abstracts.

else. A graduate student once spent many hours in the library developing a bibliography of Kurt Lewin's publications. He began with the date of Lewin's degree and worked forward in time, only to discover that in 1947 a complete bibliography was published with Lewin's obituary, and it included three more articles than he had been able to find.

After the guide sources have been exhausted, the next step is to consult some of the citations already found. Here, too, the best sequence is a backward one. Each article must be studied carefully to ascertain which of its references pertain to the main theme of the investigation. When one begins to pick up several citations to the same article, it is pretty clearly an important paper. Working forward in time does not lend itself so well to the reconstruction of a topic's development. Inspection of articles before the bibliography is completed is not incompatible with efficient search; it aids in maintaining direction, and it may produce significant additions to the bibliography.

Mechanics of Record Keeping. How the discovered citations are noted and filed is a matter of individual choice and familiarity. Certainly, for ease of storage and sorting and for general convenience, each citation should be on a separate card or sheet. The 3 x 5, 4 x 6, or 5 x 8 inch file cards are most popular, with the choice among them depending upon storage facilities and the amount one wishes to enter on each card. The bibliographer may take all of his notes on the main card or on additional cards filed behind it. Some authorities warn that much time will be saved in the rearrangement of ideas, hypotheses, and quotations for one's own writing if each note is on a separate piece of paper, properly identified as to source. Where one expects to use many quotations, this is surely good advice.

One widely practiced method is to copy only the citation on a 3 x 5 card and assign to it a sequence number. When the article itself is studied and notes are taken, they may be recorded in a loose-leaf notebook. Instead of recopying the citation, only the sequence number need now be used. Cards may be filed by sequence number, or alphabetically with a cross-index by number. The latter system facilitates the avoidance of duplicating entries. The author's name with the date may also serve as identification on the note page. Other systems are also available (see A 283, Chap. 11). The important point is to plan a good system at the start and stay with it in order to avoid error, loss of time, and the possibility of having to redo part of the work.

If the bibliography cards are not to be handled excessively, note paper cut to size has some advantages. It can be stored in a smaller space and it is cheaper. If one has access to a mimeographing ma-

chine, he will usually find an abundance of discarded sheets which may be cut and used on the reverse side, at least for preliminary work. Cutting must be to exact size; even millimeter variations increase the task of filing. Pads of paper this size are available commercially at a reasonable price.

Small Manila envelopes, available in bookstores in standard file card sizes, will be found helpful during construction stages. The practice of stuffing loose cards in a briefcase or notebook merely invites loss and repetition of work.

Photocopying devices and methods have become reasonable in price in recent years. Reflex sensitized paper methods involve the least investment of materials, space, and skill and are actually cheaper than secretarial copying of abstracts and citations (12). The methods are also free from inaccuracies and the need for proofreading. Many university photographic or duplicating bureaus have facilities for this service at an extremely reasonable cost. Departments sometimes find the few necessary materials a good investment.

Valuable Skills. Certain habits, skills, and knowledge will be found well worth developing if the bibliographer would improve his efficiency. Scientists are not usually trained librarians, but neither should they be ignorant of general library practice. Expert reference librarians are rarely available to aid the scientist as extensively as he might wish. Chapter 5 is intended to help increase skill in the use of the library.

When the worker tackles the index of a guide, the more he knows about the subject, the more he is likely to discover anew. One should list the topic under as many synonyms as possible, maintaining a careful record of what words or terms have been searched and for what years. After some inspection, new terms may occur to the worker, or be suggested by cross-references in the index. He may need to re-search volumes where the new term had been missed. A good knowledge of indexing methods should be of help.

Note-taking is a task at which most scientists eventually develop a self-made system if they are not already proficient at shorthand. In copying citations, certain private abbreviations and writing shortcuts are certainly of time-saving value, provided they can be read accurately later and they are carefully corrected before publication. Several suggestions for workable systems have appeared in the literature (11, 14).

Many scientists and scientists-in-training, as well as the undergraduate, could profit by the improvement of reading skill. The ability to scan rapidly is extremely valuable in preparing a bibliography. One must quickly separate that which is of only passing value from that which merits further detailed study. Indiscriminate perusal of all bibliographic discoveries is likely to bog down the task before it progresses very far.

Extensive note-taking of one's own ideas as he scans is insurance against loss, since such fleeting inspirations are by nature doomed to severe competition in retention. Library "browsing" is an art reported by many to contribute to successful work. Creative thinking can proceed during the active search, but with many workers, interruptions of this nature aid in the organization of ideas, in providing a better perspective on the task, and in invigorating the work.

Summary Statement

The last part of this chapter has been an attempt to construct a guide for the psychologist in preparing a bibliography for a report, a thesis, or a published work. The rules set forth here attempt to bring together into a workable yet simple system the best of the current practices found in the psychological literature. The reader should have no difficulty in finding examples of the various bibliographic rules in the lists of references found at the end of the chapters and in Appendices A and B. Finally, methodological suggestions for library research have been presented as a means by which time may be saved and the task made more satisfying.

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CHAPTER 5

Library Problems and Classification

In the two preceding chapters we have discussed certain problems concerned with the literature of psychology and have attempted to describe methods for facilitating the use of this literature. For most books and journals needed, the student will turn to the university library, although for some subjects he may have considerable literature in his own possession. Using a library or maintaining one's own collection involves certain skills which are of inestimable value in facilitating the searching of literature. The operation of even a modest college library involves a considerable number of technical processes about which we cannot be concerned but without which it would be impossible for the user to secure the material he desires promptly. Our interest must be limited to those aspects of the library with which the graduate student is likely to come into contact.

Although university libraries differ in the details of their procedures, the basic plans are sufficiently similar to make transfer of training a simple matter. The student should early become familiar with the arrangement of his particular library. He should learn its system of classification and how books are arranged within that classification in the stacks and special rooms of that library. Such operating questions as permission to use the stacks, methods of procuring a book at the circulation desk, methods of checking out books from the stacks, and the use of special study rooms vary from library to library and must be determined for each particular one. However, library catalogs follow a rather constant pattern, and systems of bibliographic classification in common use are fairly standard. In addition to its own book and general collections, libraries offer other services frequently of value to the person doing research. In the following pages we shall undertake to explain the standard type of library catalog, to describe the two most frequently used general

classification schemes and to refer to certain special classifications which have been developed for psychological purposes, and finally to call attention to certain of the special library services which are frequently available.

THE CATALOG

The usual first point of contact with a library is the catalog. Modern catalogs are arranged on cards, which may be added to or shifted about with relatively little cost in time or money. These catalogs are usually of a dictionary type, i.e., the cards for author, subject, and title are arranged in one alphabet. In most university


Kelly, E	Lowell.	1
The prediction of performance in clinical psychology, by E. Lowell Kelly and Donald W. Fiske. Ann Arbor, University of Michigan Press, 1951.		2
xv, 312 p. illus. 20 cm.		3
"Research ... carried out during the years 1946-51 under Contract VAm-22756 between the Veterans Administration and the University of Michigan."		4
Bibliography: p. 303-306.		5
1. Psychology as a profession. 2. Clinical psychology	i. Fiske,	6
Donald Winslow, 1910-	joint author. II. Title.	
BF76.K4	616.8069	51-14688
Library of Congress		

FIGURE 7. *Library of Congress card.*

libraries printed cards issued by the Library of Congress predominate, although there may be typewritten cards added for material in the university library for which no Library of Congress card has been issued. Because the catalog card contains a great deal of information which is frequently completely mysterious to many users, it appears worthwhile to illustrate such a card and to discuss its various parts. Further information concerning the printed Library of Congress cards may be secured from the chief of the Card Division, Library of Congress, Washington 25, D.C.

The card shown in Figure 7 may be considered as having six sections as indicated in the right-hand margin. *Section 1* includes the wide upper margin used by libraries for typing subject headings, additional authors' names, or title. In the upper left-hand corner

the library's call number is placed. The author's name (the first author's, if there are more than one), as completely as is known, and his dates of birth and death, when known, are the first printed entry on the card.

Section 2 includes the complete title, the author's name, publication place, publisher, and date. Names of joint authors, editors, translators, and so forth, as well as the edition, are noted here when necessary. Information included here is included on the authority of the title page of the book; material included from any other source is put in square brackets.

Section 3 describes the book. In this example the entry "xv, 311 p. illus. 29 cm." is interpreted "fifteen preliminary pages, and 311 numbered pages; illustrations; the book is 29 centimeters high." For titles which are part of a series, e.g., monographs, the series title and volume, number, or other identifying data are given in this section.

Section 4 includes a variety of descriptive information, the amount of which may vary from nothing at all to a reproduction of the table of contents for anthologies or other collections. Cards for books of a technical nature which have bibliographies always contain a notation concerning the bibliography. In the example used there is a note describing the auspices under which the study was done.

Section 5 includes additional entries ("tracings") under which cards for this book will be found in the catalog of the Library of Congress and usually in other research libraries. For this book there would be cards under two subject headings, the second author, and the title, as well as the main author entry card.

In *Section 6* the three numbers reading from left to right have the following meanings: left, Library of Congress classification number; center, Dewey Decimal Classification number; right, Library of Congress card number by which the card may be ordered.

Library of Congress cards may be ordered from the Library's Card Division. Information concerning them may be secured from the Chief of the Division (10).

Each of the three types of entry, viz., author, title, and subject, present special problems which deserve comment. Author entries may include names of individuals as authors or names of institutions or agencies, commonly called corporate authors. Personal names are arranged alphabetically by surname and then by first and second

given names. Detailed rules for alphabetization of surnames with prefixes, foreign letters, and contractions are complex. The major points are discussed in Chapter 4 in connection with the arrangement of bibliographies. In most libraries the catalog includes cross-reference cards from variants of a name, but the user should check known variations. Corporate authors are filed in the usual fashion, with the complete name of the institution or agency being given. Condensed rules for corporate authors are given by Louttit (14). Title entries present no particular problems, except that it should be kept in mind that the articles "a," "an," and "the," as well as their equivalents in foreign languages, are never used. The first main word of the title determines the alphabetical position.

Subject cards as found in the catalog drawers are based almost exclusively on tables of standard library "subject headings" rather than being made for a specific subject in each individual case. Subject headings are not designed to serve the particular needs of the specialist.

It cannot be expected that detailed divisions of a subject will be found in their alphabetical position, as one could expect in a good book index. As an illustration of the rather gross categories usually found, the Library of Congress (19) subject headings for psychology are:

- Psychology
- Psychology, Applied
- Psychology, Comparative
- Psychology, Forensic
- Psychology, Pastoral
- Psychology, Pathological
- Psychology, Patristic
- Psychology, Physiological
- Psychology, Religious

CLASSIFICATION

The great amount of material found in the research library necessitates some system of classification in order that specific material may be made easily available and with maximum efficiency. In the private collection the problem is somewhat different, but here also expediency dictates the use of some system of orderly arrangement. Most libraries arrange their collections according to the subject; that is, books on one subject are stacked together and those on re-

lated subjects are placed nearby. At the present time there are two widely used systems of classification. The most common is the Dewey Decimal Classification; the other, used by a number of large libraries, is the Library of Congress Classification. A few libraries still use their own system, which may or may not be a modification of those mentioned. In any case a few minutes spent in the library itself will enable the student to learn at least the outlines of the classifying system and arrangement of books.

Dewey Decimal Classification

This system, extensively used in university and public libraries, was first published in 1876. It was the work of Melvil Dewey, who conceived the basic notion as an undergraduate at Amherst and later submitted it as a thesis for his master's degree. The wide acceptance accorded Dewey's system is a significant tribute to the importance of this contribution to library science. It has been said that 1876 marked the beginning of a new era in library organization, when librarians first really began systematically the dual task of guarding and circulating the records of human knowledge. It should be noted how close this event was to the beginnings of psychology as a science.

Dewey divided the whole of human knowledge into ten divisions, with provision for each to be divided further into ten divisions, each of these into ten, and so on into as many subclasses as necessary. Small categories fit into larger ones logically, so that by the use of a numbering code the nature of a work can be ascertained by its catalog number. The classification number therefore tells *what* and *where*. The symbols of the Dewey schedules are numerical, with the major division indicated by three digits to the left of a decimal point, and finer subdivisions by an expandable decimal fraction to the right of the point.

The ten basic classes, with Dewey's concept of man's accumulated knowledge, are as follows:

000. *General works*. Collections where the content spreads over many or all of the remaining categories (e.g., encyclopedias).
100. *Philosophy*. Man's relation to himself.
200. *Religion*. Man's relation to the cosmic.
300. *Social sciences*. Man's relation to his fellowman.
400. *Language*. Man's communication with man.

- 500. *Pure science*. Man's relation to the physical world.
- 600. *Applied science*. Man's adaptation to and use of the physical world.
- 700. *Fine arts*. Man's artistic expression in sound, form, and color.
- 800. *Literature*. Man's creative expression in word symbols.
- 900. *History*. Man's record of himself.

Psychology in Dewey's day did not have a very important status as an independent discipline. Two subclasses of philosophy, "130. Mind and body" and "150. Psychology," were entirely adequate and would remain so today were it not for the vast changes in and tremendous expansion of our science. We may still think of psychology in a narrow sense as being concerned with one aspect of "man's relation to himself," but this view itself has taken us into all of the nine specific Dewey classes. We know that man is related to himself not only directly, but complexly, involving interactions of variables from his whole life-space. Thus the library, which must classify all of man's recorded knowledge, and psychology, which must consider every aspect of behavior and seek variables wherever they may be found, are in a sense parallel rather than hierarchial. The problem of understanding man's behavior is as broad and as ramified as is the problem of classifying man's knowledge.

It is not surprising, then, to find titles of direct concern to psychology in every one of the major divisions and a great many of the smaller classes. A special new classification for modern psychology was included in the 13th edition (6) of the Dewey scheme. The inadequacies of the classification (12), and the difficulty or impossibility of making the necessary changes in library collections, resulted in the special classification's being dropped in the 14th edition. To reclassify all literature which psychologists consider of importance to their work into any special psychological classification scheme in the average university library would require years, would cost thousands of dollars, and would most certainly meet with strenuous objection from departments—education, physics, physiology, biology, sociology, and so on—which would lose books and journals they consider of equal value to them. For the psychologist, the library classification of his subject is unsatisfactory, but it is worth noting that these troubles are not confined to psychology. A library Ph.D. thesis (11) showed that only about 5 per cent of the available material on elephants is to be found in the elephant category!

The clearest solution for psychology would seem to be that we should intensify our knowledge of the library, making frequent use of the latest Dewey manual (7), which includes an index of classification numbers by subject. We should learn to translate our needs into the librarian's way of thinking, following the concepts employed by Dewey in the major categories.

Despite the scattering, a majority of psychology titles will be found in the subclasses of 130 and 150. The headings of these classes in the 15th edition (7) are as follows:

130 Fields of psychology	139 Phrenology
131 Psychosomatics (includes clinical psychology and psychoanalysis)	150 Psychology
132 Abnormal Psychology	151 Intelligence
133 Occultism	152 Sensation Perception
134 Hypnotism Mesmerism	153 Cognition
135 Dreams	154 Memory Learning
136 Genetic Psychology	155 Imagination
137 Individual Psychology	156 Intuition
138 Physiognomy	157 Emotion
	158 Conation Movement
	159 Motivation*

In usual practice in a general library, works on psychology in relation to other fields are located with the other subject. Details of placement in individual cases depend on decisions of the library classifier and the policies of the library. Illustrations of such subject-field relations, with the classification numbers appearing in the index of subjects of the Dewey 14th and 15th editions, are:

Personality	126. & 127.
Psychology of religion	201.6
Pastoral psychology	253.5
Social psychology	301.1 & 364.3
Statistics (including psychological)	311.
Military psychology	355.
Educational psychology	370.15
Psychology of language	401.
Animal behavior	591.5
Physiological psychology	612.8
Clinical psychology	616.8
Applied psychology	658. & 659.
Aesthetics	701. & 781.
Psychology of literature	801. & 808.1
Biography of psychologists	921.*

* From *Decimal classification devised by Melvil Dewey*. 15th ed. Lake Placid, N.Y.: Forest Press, 1951. Reprinted with the permission of the Lake Placid Club Education Foundation, owners of the copyright.

Library of Congress Classification

The classification schedules published by the Library of Congress have in large measure been empirically developed in relation to the collections, totaling over 8,000,000 volumes, of that library. The basis of the Library of Congress scheme is the division of knowledge into 26 classes, each labeled by a letter of the alphabet. Further subdivision is secured by adding capital letters and numerals, e.g., applied psychology is BF 635. The main divisions as published in the *Outline Scheme of Classes* (18), together with a few subdivisions of interest in psychology, are:

A	General works, polygraphy	HV	Social pathology
B-BJ	Philosophy	J	Political science
BL-BX	Religion	K	Law
BF	Psychology	L	Education
C	History: auxiliary sciences	M	Music
D	History and topography (except America)	N	Fine arts
E	America (general) and U.S. (general)	P	Language and literature
F	U.S. (local) and America (except U.S.)	Q	Science
G	Geography, voyages, travel	QL	Zoology
GN	Anthropology	QM	Human anatomy
GR	Folklore	QP	Physiology
H	Social science	R	Medicine
HM	Sociology	S	Agriculture
HQ	Family, marriage, women	T	Technology
		U	Military science
		V	Naval science
		Z	Bibliography

CLASSIFICATIONS FOR PSYCHOLOGY

Psychological Abstracts Classification. Systematic listing of psychological publications began with the *Psychological Index* in 1894. The classification scheme used in the *Index* and later taken over in part by *Psychological Abstracts* in 1927 afforded an immediately available scheme for use by psychologists in classifying other materials. The details of the classes used in the *Index* and in early volumes of the *Abstracts* changed in minor or major ways almost annually, and today are of only historical interest.

The arrangement of material currently used in *Psychological Abstracts*, together with the code in use in the Editorial Office, may be found useful as a simple basis for analyzing materials in personal collections:

1. General
 - a. Theory and systems
 - b. Methods and apparatus
 - c. New tests
 - d. Statistics
 - e. Reference works
 - f. Organizations
 - g. History and biography
 - h. Professional problems of psychology
 - i. Films
2. Physiological psychology
 - a. Nervous system
3. Receptive and perceptual processes
 - a. Vision
 - b. Audition
4. Response processes
5. Complex processes and organizations
 - a. Learning and memory
 - b. Thinking and imagination
 - c. Intelligence
 - d. Personality
 - e. Aesthetics
6. Developmental psychology
 - a. Childhood and adolescence
 - b. Maturity and old age
7. Social psychology
 - a. Methods and measurements
 - b. Cultures and cultural relations
 - c. Social institutions
 - d. Language and communications
 - e. Social actions
8. Clinical psychology, guidance, counseling
 - a. Methodology, techniques
 - b. Diagnosis and evaluation
 - c. Treatment methods
 - d. Child guidance
 - e. Vocational guidance
9. Behavior deviations
 - a. Mental deficiency
 - b. Behavior problems
 - c. Speech disorders

- d. Crime and delinquency
- e. Psychoses
- f. Psychoneurosis
- g. Psychosomatics
- h. Clinical neurology
- i. Physically handicapped
- 10. Educational psychology
 - a. School learning
 - b. Interests, attitudes, and habits
 - c. Special education
 - d. Educational guidance
 - e. Educational measurement
 - f. Education staff personnel
- 11. Personnel psychology
 - a. Selection and placement
 - b. Labor-management relations
- 12. Industrial and other application
 - a. Industry
 - b. Business and commerce
 - c. Professions
- 13. Unpublished theses

This scheme is empirical rather than logical and has been developed to meet the needs of presenting abstracts with a degree of subject grouping but avoiding complex minutiae. The system is not permanently fixed but is subject to change as the desires of readers and content of the literature change.

Louttit Classifications. One of the present authors has published two classification schedules for psychological literature. The first appeared in a condensed form in 1941 (13). The basic tables had been started in 1929 and a provisional mimeographed edition issued in 1931. In 1940 the basic table had over 2,250 classes but was still not considered complete in details. The condensed tables of 1941 had 425 classes with 13 major divisions. The class numbers are on an alphabetical base, with subdivision being decimal. These condensed schedules served as the basis for both the scheme described here and the present divisions used in *Psychological Abstracts*.

In 1936 H. E. Bliss (3) published the first volume of his System of Bibliographical Classification, which was based on a combination of bibliographic and logic principles developed in earlier volumes. The general schedules included in the 1936 volume developed the major categories of a system of classification which is designed as a modern method of library or bibliographical classification. It is as

extensive and, when completed in details, will be as comprehensive as either the Dewey or the Library of Congress system. Bliss's system is significant for psychology because for the first time this important area is given a major locus in the scheme. The divisions are on a 26-class basis and the symbols are alphabetic. Psychology, Class I, is preceded by Biological Sciences in Classes E, F, and G, and Anthropology, Class H, and followed by Education, Class J, and Social Sciences, Class K. The detailed development of Class I, Psychology, the collaborative work of Bliss and Louttit (5), was published in 1947. As is true of other classes in this system there are certain general categories designated by numerals, whereas the major divisions have letter designators. The major divisions in each of these categories are here presented:

I. (General Materials)

1. Reference works
2. Bibliography
3. Scope, study, and history of psychology
4. Biography
5. Associations
6. Periodicals
7. Miscellanies, collections
8. Methods

(These numerical general divisions may be used with any regular subdivision by adding the number after the letters of the class designation.)

- IA Psychology, general
- IB Physiological, neurological psychology
- IC Sensation and perception
- ID Feeling (affection) and emotion
- IE Motor actions and volitions
- IF Intellectual, "higher" mental processes and developments
- IG Personality, intelligence, and mental abilities
- IH Differential psychology
- II "Type psychology"
- IJ Mental hygiene
- IK Subconscious mental states and psychoanalysis
- IL Abnormal psychology
- IM Psychiatry: mental disorders and diseases: psychopathology
- IN Psychological jurisprudence, legal psychology
- IO "Psychical research," occult psychology, parapsychology
- IP Social psychology
- IQ Alternate for genetic psychology, better in a subclass of IA)

IR	Anthropological and racial psychology
IS	Unassigned
IT	
IU	
IV	Child psychology, adolescence
IW	Applied psychology in general
IY	Psychology and education
IZ	Psychology and sociology

The published schedules include division to a third letter and in a few cases to a fourth. In addition, explanatory notes suggest alternative placement of material which might be classed elsewhere in the scheme.

Other Classification Schemes. In addition to the general classification schemes just mentioned, several have been published for special purposes. Fischer, Rappaport, and Gibbons (9) include in their discussion of the use of McBee Keysort cards for bibliographic purposes a "subject-matter code for psychology." Although intended to be "used for classifying material in the field of psychology," it has serious omissions, e.g., no provision for sensation and perception, child psychology, or response processes, and many logically questionable placements. The code system is decimal but does not extend beyond hundreds.

Anderson's classification (1) for the literature on child development and child psychology has 26 major divisions designated by letters, and two degrees of subdivisions, each designated by the numerals 1 to 9, one used in the unit and the other in the first decimal position. Intended primarily for ordering personal collections of reprints or notes, the scheme provides three degrees of complexity: Primary, with 26 headings; Secondary, with 234 headings; and Tertiary (complete), with 2,106 headings.

Miller (15), in a decimal-type classification scheme to be used in small medical libraries, includes five major classes (numbered 10 to 14) for use in a psychiatric hospital. These classes are: Neurology, Psychology, Psychiatry and Psychobiology, Psychoanalysis, and Psychotherapy. The subdivisions and their interrelations are particularly adapted to the special purposes intended.

SPECIAL LIBRARY SERVICE

In addition to loan and reference collections, many libraries offer other services that are not so well known. Those discussed here are

invaluable to the research worker in enabling him to secure necessary material which is not in the library available to him and which would be prohibitively costly in the open market.

Interlibrary Loans. It is hardly to be expected that libraries at some distance will loan books—in many cases valuable books—to individuals, but they will usually lend material to other libraries. The individual makes a request of his local library for a book, which it in turn borrows from the distant library and loans to him. The ultimate borrower usually assumes the cost of transportation both ways, and the borrowing library assumes responsibility for the safe return of the book. As long as such a book is in the possession of the borrower, it is of no use to the lending library, and so courtesy would require that it be returned as soon as possible. At any rate, it must be returned within a certain time limit set by the lending library.

Photographic Reproduction. Most larger libraries, particularly those of universities, and independent research libraries will furnish photostats or microfilm copies of materials in their collections. Although there are copyright complications for recent books, materials from journals and older books may be obtained. The cost of reproduction of either type is nominal. For example, the Army Medical Library will supply photostats at 50 cents per 5 pages (or fraction of that number from a single article). Microfilm costs 50 cents for 50 pages (or fraction thereof from a single article). The charges at other libraries are similar. Each method of reproduction has its advantages. Photostats are usually nearly full size or with slight reduction for extra-large pages and they may be read directly. Also, the sheets may be bound or fastened together and then filed as a book or pamphlet. Microfilms are less expensive and include more material in less space, but require special apparatus for reading and must be handled and stored with special care. However, these photo-reproduction services make available material which may not be secured through interlibrary loans. Also, the document may be added to the purchaser's own collection. The Special Libraries Association (17) has published a directory of microfilm services including information on the use of such services. Libraries having photographic service are listed in geographic order with a statement of services offered and costs.

Union Lists. One problem which must be solved before requests

can be made for interlibrary loans or photo-reproductions is that of finding what library owns the material desired. Reference librarians are willing to help in locating material, but certain publications should be familiar.

Journal files may be located in the *Union List of Serials* (A 15), described in Chapter 3. Haskell and Brown (A 11) are the compilers of a bibliography of other union lists, usually for smaller geographical regions.

There is no similar single publication for books, and it is evident that such a list would be practically impossible. However, the Library of Congress has for many years maintained the National Union Catalog, which, according to the annual report of the Librarian for 1950 (20), includes an estimated 12,365,736 title cards. Titles from a number of sources are added to this list with indication of location in a considerable number of libraries in the United States.

If a copy of a particular book cannot otherwise be located, the Library of Congress will check this union list for the information. Further, if the title cannot be located, it will be included in a weekly inquiry publication sent to all major libraries. In this manner copies of most volumes inquired about are ultimately located. The history and operation of the National Union Catalogue have been described by Schwegmann (16).

Books in the Library of Congress itself are easily located through duplicate card catalogs maintained in a number of larger libraries, and more readily in the published volumes which reproduce the cards (A 5-7). The original 167 volumes include all cards published to July 31, 1942; the 42 supplementary volumes include cards published between August 1, 1942, and December 31, 1947. Currently issued cards are included in a cumulative catalog (A 8), which appears monthly with quarterly and annual cumulations.

The specific problem of interlibrary loans has been discussed by Constance Winchell (21), whose book is still the standard reference on this topic. She includes a bibliography of publications showing the location of books in American libraries. Considerably more recent is a volume edited by Robert B. Downs (8), which is concerned with the problem of union catalogs and in which Berthold (2) has a directory of 117 places where union catalogs are maintained.

PERSONAL LIBRARY

It is inevitable and desirable that the graduate student will soon begin to accumulate a library of his own. Obviously many students will start graduate work in possession of at least their undergraduate textbooks. To these will be added textbooks for graduate courses and a certain number of reference works or general textbooks. Very soon the graduate student will begin to save reprints and other pamphlet publications, especially those which relate to topics of immediate interest. If he becomes associated with the student journal group of the American Psychological Association, he will begin to receive the *American Psychologist* and *Psychological Abstracts*. Further, he may subscribe to other journals of special interest. Included in his personal library will be notes and notebooks containing material from classes, material secured in the preparation of seminar papers, and records of research. The amount of material an individual student will accumulate depends upon his own proclivities, but large or small, his library must be arranged for most effective use.

Three problems that must be faced are storage, accessibility, and moving. Storage on shelves, in files of various types, or in drawers will be governed in some measure by office, laboratory, or living space available. Closely allied with this problem is that of moving, which almost all students must meet. These two factors are strong arguments for some degree of selectivity in items to be saved and, therefore, impose limitations on acquisition. However, it is well to keep in mind that books may prove of greatest usefulness at future times. Less permanent items, such as reprints or manuscripts, require judgment in deciding the questions of what and how much to save. It is impossible for anyone else to do more than express caution to the student; he alone can decide what he feels may be useful at a later date.

The question of accessibility of material in one's collection is highly significant. Dozens of books, scores of reprints, separate issues of journals, and notebooks without end piled in stacks on the floor or on book shelves are of questionable value for a useful working library. A system of arrangement is necessary even though the system may be very simple and quite idiosyncratic in its nature. Fur-

ther, it is well that some system be started very early so that during the period of active graduate work materials are always readily available.

The backbone of any useful library is the book. The inevitable starting point will be required textbooks. To this are soon added treatises and monographs recommended or found valuable for some psychological interest. The number of books to be acquired cannot be categorically stated; it depends on the student's pocketbook and on his personal interests. Books are relatively simple to store because they can be ranged conveniently on book shelves offering endless variety in size and shape. The actual order in which books are to be shelved makes little difference until the number reaches a point where the backbone titles cannot be perceived in a relatively brief time. Such a point cannot be exactly stated, but when books increase beyond two score, there is probably argument for a simple arrangement. At least current textbooks and reference books should be immediately at hand. Until the library reaches about one hundred volumes, simple major divisions, e.g., general textbooks, experimental works, clinical texts, and so on, can be grouped together; even a simple arrangement alphabetically by author's name is useful. When volumes begin to exceed the one hundred mark, it will be found profitable to arrange them according to some simple subject classification scheme, which may be based on schedules discussed earlier. Beyond 1,000 volumes it is almost necessary that books be arranged according to some consistent method. Otherwise the book needed at a particular moment may be temporarily impossible to find.

Files of professional journals are valuable, but there is serious question whether it is wise to attempt the acquisition of a large number. It is surprising how fast the files of even a few journals will accumulate and how much space they will demand. Unless the student expects to spend a considerable part of his professional career in a location where a reasonable library is not available, he should probably exercise caution in the saving of journal files. The mere cost of journal subscriptions is usually a deterrent to accumulation. Here again the student himself must decide what he believes necessary. For most efficient use it will be found desirable to keep the issues of each journal together, even in unbound issues. This can be conveniently done by tying them with a string, or possibly by keeping each journal in a file box of the proper size. Book mailing cartons are

useful. For those journals which the individual feels he wants to save, it will be found desirable to have each volume bound. Such binding seldom costs more than a few dollars, and it is the only satisfactory way of insuring against loss or spoiling of journal files. Also, when bound, journal volumes are more conveniently handled as part of a book collection.

Probably the kinds of material which have caused most difficulty are reprints, pamphlets, and mimeographed or typewritten manuscripts. It is astonishing how quickly such material accumulates with very little effort on the student's part. One of us in less than ten years had accumulated over 5,000 such items. Because of this fact the question must be answered sooner or later whether everything will be saved or whether a selective criterion will be exercised. It seems a safe generalization that the immediate interests will vary from time to time. Because of this it appears questionable whether the student should continue to save every item which comes to hand. Although no universally valid rules can be stated, the student will want to save certain groups of subjects—for example, material which relates directly or indirectly to the research area in which he is writing a thesis; more general articles which would be useful at a later time in supplying content for general courses; and, if the student has decided definitely on his professional specialty, material in this area. Following these examples, the student can decide what additional topics he feels may prove useful at a future time. Furthermore, there should probably be a weeding out of this material from time to time as interests change or as the necessity of moving demands a reduction in weight.

The matter of providing for accessibility of pamphlet material is even more serious than in the case of books. Looking through a pile of 100 four-to-eight-page reprints for a particular article will demand considerable time; 1,000 reprints in a similar mixed condition will require more than ten times as much searching. Here the necessity for a systematic arrangement is imperative. If the student's tastes are catholic, he should early begin arranging reprint material according to a general classification system. If his saving is on a selective basis, the system can reflect his interest to a greater extent. Many teachers who make no attempt to save everything they may acquire arrange reprints according to courses they teach, research problems they may be working on, or subjects about which they

are writing. This is a convenient method but, of course, does not provide for the article which is of significance to two or more of the owner's special interests.

The actual storing of reprint material presents difficult problems. Probably the simplest method is to develop what libraries call a "vertical file" in the drawer of an ordinary four-drawer letter file. A single drawer will hold several hundred reprints, and subject divisions of any classification arrangement are easily indicated on dividers or folders. However, letter files are expensive, and if a collection gets very large, it will require a number of units. Letter-size file boxes, sometimes known as transfer cases, are useful for reprints. Such a box, labeled in as much detail as the subject and the amount of material demand, may be stood on a book shelf and be readily available. It is needless to suggest the many kinds of office filing equipment that may be used in caring for reprints. The important thing is that the material be kept in such a fashion that any desired reprint may be readily found.

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PART III

Reporting Psychological Research



CHAPTER 6

Written Communication

We saw in Chapter 2 how psychological literature in America has continuously served a major role in the progress of the science, and earlier, in Chapter 1, how important the learning of how to communicate is considered to be. It is the purpose of this chapter to serve as a guide for acceptable structure of reports and to develop some aids toward improvement of style in the expression of ideas which by necessity are often complex. For the present, emphasis will be upon the major forms of written scientific reports. Minor reporting will be considered in a later chapter.

PLANNING THE REPORT

Even before the writing of a report is started, certain considerations will need to be kept in mind if the final product is to be as effective as desired. In the first place, writing from an outline is mandatory. Writing done otherwise inevitably shows a lack of coherence. Although the need for this kind of planning seems so obvious that it might as well be left unsaid, many first-draft theses, some dissertations, and not a few manuscripts submitted for publication show no evidence of such a practice. Not only should the communication be written from an outline, but throughout the re-write and in the final form, the outline should *show*.

Secondly, the audience for which the report is being prepared should dictate its nature from the beginning. The way one writes for one's colleagues is different from the way one writes for an audience of educated laymen; a lecture before an advanced class is certainly not planned the same way as a radio talk. Writing from the start with the audience in mind results in better suitability than any attempt to make modifications after the job is an accomplished fact.

A third significant planning aim is brevity. Some writers can

write extensively, then cut and condense without hesitation. For many another, resistance to the brutal destruction of his own productivity hinders such a practice. Learning to write directly in a sharp, concise style not only results in better products but probably transfers to an improvement in thinking and general communication effectiveness.

We shall comment on these points, directly or indirectly, in the following pages. They are emphasized here as considerations which must be before the writer at the start of his writing job.

STRUCTURE OF THE SCIENTIFIC REPORT

Since the great bulk of psychological literature can be roughly classified as research reports, we shall turn first to that form and devote most of our attention to it. In most cases, this will be the type of the young scientist's first "public appearance" in print and probably also that with which he will have the most contact in his professional career. Two additional forms, the theoretical article and the literature survey, are also considered as major forms of scientific reporting.

The Typical Research Report

Titles. Not always—perhaps not often—will an author begin his work by composing the title, but *that's where the reader begins* and therein lies its importance, for the report is directly for the reader's benefit and only indirectly for the benefit of the author. Insofar as the latter is concerned, a title is superfluous—he knows what it is about. The reader uses that title, from the table of contents, from the head of the article, or in codified form in an index. For him it is an invitation to seek more or a warning to stay away, an enigma or merely an unattractive and unnoticed signpost.

Authorities on writing have given some sound suggestions for composing good titles. Reduced to four simple rules, they might read like this: Good titles should be (1) brief, (2) specific and exact, (3) well structured, and (4) attractive. Now let us examine these, adding some illustrations and a qualification or two.

Brevity is an asset throughout all scientific writing, and one might just as well start by applying it to the title. A good maximum to keep in mind is 15 words. An editor will need to compose a *running title* for pages following the first page, and here the limit is

about 45 letters. If the full title can be kept to this limit, all the better. Superfluities which can usually be eliminated from titles are such expressions as "a study of . . .," "a report concerning . . .," or "an experiment on. . . ." Any extensive bibliography will yield many good examples of short titles; here is an especially horrible example of a long one:

Farrow, E. P. *A practical method of self-analysis, enabling anyone to become deeply psycho-analyzed without a personal analyst, with some results obtained by the author from early childhood, the earliest memories going back to the age of six months; also recounting the author's personal experience with two psychoanalysts; with foreword by the late Sigmund Freud.* London: G. Allen, 1942.

Title indeed! More like a table of contents. On the other hand, titles can be too brief. Saying too little will result in a higher probability of duplicating existing titles and will violate rule No. 2.

The second rule—specificity—has several values. A common complaint about titles is that they are too general. An ideal title might indicate both a fairly broad area of psychology and the specific segment covered in the article. If only one of these is mentioned, the segment is preferred, since the broader area may be inferred, but the opposite situation is unlikely. You cannot tell the whole story in the title, so select that which most exactly represents the main idea and say it succinctly. Remember that your title will be listed in *Psychological Abstracts* and in other bibliographic works. If the bibliography is classified by subject, the specificity of the title may be an important factor in its proper location; and in subject indexes the title may determine all or part of the index entries. Thus for the reader, and for later bibliographers and indexers, the author's care in wording his title is of great value.

Titles are sometimes misleading, even though they seem to be exact, because of a lack of common agreement on the meaning of certain terms. "Action research" may refer to social action or response mechanisms. The book *Principles of Human Engineering* is concerned with religion and philosophy. *Color Blind* is a book on the race problem (rule No. 4 given precedence over rule No. 2). We recently saw an article entitled, "The theory of confounding in factorial experiments in relation to the theory of groups" included in a published bibliography on "group therapy," but the statistical groups here meant something quite different. There are two obvious

lessons in these illustrations: Be careful that the term you use has only one referent, and avoid selecting bibliographic items by title only.

The third requirement, that a title have good structure, merely means that it should convey the idea clearly without a possibility of confusion or the need of extensive study. A variety of structures are used, such as the following:

1. A substantive with a modifying phrase (about 60 per cent of all titles in current psychological literature). For example, "The perception of visual surfaces."
2. A more or less specific relationship between two substantives (about 20 per cent). For example, "Personality dynamics during success-failure sequences."
3. Parallel substantive structure (about 10 per cent). For example, "Knowledge and thinking."
4. Verb forms, full sentences, nouns-with-adjectives, or loosely structured forms make up the remaining 10 per cent.

Despite its being badly outnumbered by the first type, the "specific relationship" title is the most revealing and is more in keeping with our rule No. 2. Relationships of the following types are considered to be in this form:

"A comparison of . . . and . . ."

"The influence of . . . upon . . ."

"The action of . . . upon . . ."

"The relation between . . . and . . ."

"The . . . as a function of . . ."

"The determination of . . . by . . .," and so forth.

As for rule No. 4, there is no loss of dignity in making titles attractive and distinctive. Common courtesy permits us the use of a welcome to the reader to share the experience we report. The forbidding nature of some titles would give the impression that the author dares anyone to go further. One need not write in terms of gastronomic radio commercials or cigarette advertisements, of course, but consider the consequences in terms of number of readers if "The Flesch and the spirit" (24) had been "A critique of Stevens and Stone"; "The snark was a Boojum" (2) had been "The rat as a laboratory animal"; or "Validity, reliability, and baloney" (6) had been "A note on test construction procedure." Who is likely to for-

get a title like "The future of psychology, or the goose that laid the golden eggs" (8), or "That whale among the fishes—the theory of emotions" (22)?

Now of course these are selected examples, they are not research reports, and they are perhaps stronger on appeal than on information. If research titles meet the requirements of the first three rules, can they also be distinctive? Well, yes, it can sometimes be done. The following examples of research article titles are likely to arouse more than ordinary interest and be remembered for having something distinctive:

"Walking spinal carnivores" (25).

"Toward a psychiatric Plimsoll mark: physiological recovery quotients in experimentally induced frustrations" (15).

"A failure to find the Blodgett effect, and some secondary observations on drive conditioning" (20).

And the reader can suggest several more. It should not be supposed that it is the first objective of an article title, like an advertisement, to attract the unwary reader. Rather, we would suggest that after the characteristics of brevity and well-structured specificity have been met, distinctiveness with dignity is surely not out of place.

Authorship. Journals now generally print the name of the author immediately underneath the title, and the manuscript is, of course, prepared in like manner. In the case of multiple authorship, the order of names generally is determined by the degree of participation in the research. When contribution is equal, the sequence may be based upon seniority. This has led to the nomenclature "senior author" and "junior author," which is unfortunate. Under certain circumstances the first-named author may be the student of the second author. A straightforward "first author" and "second author" terminology is more appropriate.

Titles and degrees held by the author are omitted, but the fullest generally used form of the name should be given. Giving a single initial or even both initials is not always complete identification and may lead to confusion. This problem is not as serious as formerly. In 1910 the editor of the *Psychological Index* complained: "The omission of authors' initials is a frequent source of perplexity. No man is so great but that modesty might suggest the claims of other writers bearing the same name. We believe that the reading

public has a right to know the initials as well as the last name of each contributor to science" (30). This statement, in only slightly modified form, was carried as a part of the "Editorial Note" annually for 20 years!

Identification of the institution or organization (not the department) with which the author is connected is given (usually) below his name. When all persons in a multiple authorship situation are from the same institution, a single mention suffices. When this is not the case, each must be clearly located.

Introductory Footnotes. Certain qualifications or explanations of title or authorship are sometimes necessary and may be handled by footnotes. The criticism against footnotes which we have posed elsewhere hardly applies here; indeed, there is no better method available. The title represents the whole report. Therefore, any required acknowledgment of advice or sponsorship is by footnote to the title. Another footnote is the prescribed "statement of non-responsibility" when the author is in military service and his report is not an official one from a military organization. Still another frequently used title footnote is that wherein the author recognizes financial or other assistance for the work reported.

In cases where the research was conducted at one location but at the time of preparation for publication the author had moved elsewhere, the prevailing custom is to give the new location, clarifying the change by a footnote to the author's name which reads, "Formerly at the University of ———." This would seem to be consistent with common courtesy to the institution which indirectly if not directly supported the work. In addition it gives the profession a more accurate view of what is going on in the various institutions.

Preliminary Discussion. The lengthy introductory discussion is going out of style. No one is protesting. One used to find all sorts of subsections here—introduction, development of the problem, history of the problem, setting, hypotheses, and so forth. In the interests of economy, journal editors are actively encouraging a brief first section to research reports. No longer does the reader tediously review with the author the whole history of a problem every time a new piece of research appears. A certain amount of professional literacy on the part of the reader is assumed. Psychology has matured at least to the extent that certain broad research problems may be referred to in a general way, without citing author and page,

experimental subjects, and standard deviations. Only those relatively few studies to which the reported research most closely relates are needed points of departure. These should not be extensively reviewed—mere identification, brief reference to the result, and a statement of its relation to the study at hand is usually sufficient. The author must be very careful in this section to convince the reader that the study has *significance*. The failure to do this has evoked more criticism against scientific reporting than any other content deficiency. For example, an anonymous writer in *Nature* says: "The dreary character of many papers printed today in scientific journals . . . [fails] to make clear the reasons for selecting the subject . . . and to emphasize the significance of the results" (33).

Justification in one or more of the following ways may be considered illustrative:

A loophole in a problem area.

Evidence for or against a theory or hypothesis.

A formerly neglected area of behavior.

An important extension of previous research.

The most important elements in the preliminary discussion section of a research report are the statements of (a) the problem and (b) the hypothesis. The two are intimately related to each other, but they may be distinguished in most cases. The problem is a question with which the researcher commences his intellectual task. Typically it is, at the stage of formation at least, an unsolved but solvable unknown. The hypothesis sets forth the general direction in which the investigator will search for his unknown—it limits, narrows, and gives direction to the task. For the researcher, it is a working solution which he attempts to support or reject through empirical observation. For the reader, a clear statement of the hypothesis aids immensely in orientation to a mental set similar to that derived by the writer. Lacking this initial guidepost, the reader who actually stays with the article through to the end does so still wondering just what the writer was attempting to do.

By way of summary, four points must be established firmly and clearly in the initial section of a research report:

1. The problem.
2. Relationship to other investigations.

3. Significance of the study.

4. Hypothesis to be investigated.

The four points may or may not be set off with appropriate headings into subsections. There is no prescribed order. Indeed, they may well be intermixed if such treatment leads to a more logical development and clarity for the reader. The objective should be always "to make the order so apparent that no difficulty is imposed upon the reader in becoming aware of the progress of facts and ideas" (7).

Description. The mid-section of a typical research report is descriptive and should follow the accepted form of that type of discourse. Unlike literary description, the scientific form is characterized by being factual, conservative, and accurate. This need not mean that it is dull or unimaginative in style, as will be explained in a later section of this chapter. Descriptive writing, when well done, draws up a picture in words. It should be the purpose of the author to describe to the reader vividly but accurately, interestingly but exactly, what was done in the investigation. It is this part which *tells the story* of the experiment.

The *experimental design* is usually described first. In former years the term *procedure* was used. However, with increasing awareness of the importance of thorough research planning and with advancing sophistication of statistical and experimental methods, the newer term has more meaning. This subsection should present for the reader a picture of the operational steps involved in manipulating the variables and obtaining the crude data. Independent and dependent variables are identified. Extraneous variables which were controlled are considered, together with a full description of the method of control. If some variables were of necessity left uncontrolled, the matter should not be ignored. Otherwise the author invites serious criticism or possible rejection by the editor. In such cases brief treatment of why they were not controlled, or could not be controlled, together with the author's considered judgment as to the net effect of the lack of control, is in order.

The *subjects* must be identified as a sample or a population. The number of subjects is quite important. Additional pertinent facts, such as species, age, sex, IQ, schooling, socio-economic level, race, and others, are frequently necessary. The writer will draw from his experience and training in determining which factors are significant

in the reported study. The degree of homogeneity in any or all of these variables must be considered and reported if pertinent. There is no excuse for the omission in a report of the number of subjects or of the measures of variability of subject variables.

Apparatus or *materials* (such as tests and the like) used in the study must be mentioned. A full description—drawings, photographs, and so forth—is needed only when such apparatus or materials are new or modified. Standard devices are merely identified by name, or reference is made to another available source for a full description. Explanation must be full enough to insure clarity for the reader. In the interest of brevity and economy, the evaluation criterion of *repeatability* is not always possible. Yet we would abandon this reluctantly if at all. It is probably true that with care any report could be written so that it could be checked by means of repetition by another scientist. The latter certainly should be able to do this from information in the original report plus additional information readily obtainable.

In this connection, it will be well to mention The American Documentation Institute (1719 N. St., N.W., Washington 6, D.C.), which has been described in the psychological literature by Britt (3). This organization is prepared to accept descriptions and drawings of apparatus, copies of materials, tables of results, formulas employed, and other pertinent recorded information which is not suitable for inclusion in the regularly published report. Such items are labeled, indexed, and photographically duplicated for a reasonable fee, then sold to interested persons at a small charge. This plan results in a reduced report, yet keeps all needed descriptions publicly available. The author informs his reader of the code number of such a document by a footnote appropriately located in his article. The standard form for this note is given in the *APA Publication Manual* (A 159). All material to be treated in this manner is sent to the editor along with the manuscript.

Experimental results are typically the final consideration in the descriptive part, or mid-section, of the report. As a rule the tabular and graphic forms of data display are greatly preferred over the verbal because of economy of space and vividness of presentation. The table is superior for condensing much data in a small space; the graph is superior for showing trends. In Chapter 7 we shall consider the techniques of tabular and graphic construction. In the

present general survey, we need only emphasize that a table is designed to give specific (usually, but not always, numerically measured) values, whereas the graph is used for showing rough comparisons and functional relationships. A common fault is found in those reports where both purposes are attempted in a single form. Both the table and graph are expensive to reproduce—a consideration which usually limits their use to some degree.

The table or graph of good quality and suitability is one which can “stand alone”—apart from the necessity of frequent and detailed reference to the text for full understanding. On the other hand, a table or graph is poorly integrated if it can be dismissed with a mere “the results are shown in Figure [or Table] 1.” The well-organized research report will likely have one or more of these relationships between text and table or figure:

1. The major findings shown will be verbalized.
2. The reader's attention will be directed to a particularly significant datum or trend.
3. A conclusion or interpretation justified by data in the table or graph will be concisely stated.
4. The data will be considered verbally in respect to the original problem or hypothesis.

Discussion. The third major section of the report is a discussion of the results. Occasionally the discussion is combined with the results and does not appear under a separate section head. While this practice may have merit in particular instances, it is usually clearer to the reader if matters of empirical fact are kept distinctly separate from the author's judgments and interpretations. Present-day systematic psychology has little argument with the data from a well-conducted and well-controlled experiment, but the constructions derived from those data are rarely fully free from divergent modes of interpretation. Since each researcher seeks his problems, hypotheses, assumptions, postulates, and system of interpretation from his own intellectual subcultural milieu of training and experience, he must be aware of the respect due others. This necessitates an unquestionable recognition and separation of crude data and the constructs built upon those data.

In addition to the author's interpretation of what he believes his results mean, two additional types of discussion may be included with profit. Here again is an opportunity to relate the study to other

work to be found in the literature. If the results have substantiated or contradicted some other studies, precise comparisons should be made. There is no reason why reference to studies not previously mentioned in the introductory sections could not be made here, if such treatment contributes to clarity and orderly presentation. Secondly, the writer should be reminded once again of the need for establishing the significance of his study. The reader needs this in the beginning in order to decide if the article is worth his time, and he needs it again near the end to emphasize the importance of utilizing the results or adding them to his repertoire of familiar psychological information.

Summary. Most research reports are sufficiently involved and lengthy to require a summary. Above all, a summary should *summarize*—not discuss. It should never introduce any new point, description, or conclusion not previously considered in the body of the paper. Its purpose is to recapitulate succinctly the story in terms of problem, method, results. The conclusions, though previously discussed, should be included in the summary by enumerated, crisp, sharply drawn statements. This is the part of the paper most likely to be quoted, and it is best to draw one's own conclusions clearly before letting anyone else try to do it. It is a compliment to the author when his own summary is suitable for presentation as an abstract in *Psychological Abstracts* without modification by the abstracter, and this means it must be kept short (150 words or under).

Documentation. As discussed previously, the bibliography serves as documentation for some portions of the paper just as tabular and graphic presentation of data serves as documentation for the conclusions and interpretations. Since there are a great many details of treatment in the bibliography, the problem has been covered thoroughly as a section of Chapter 4. We need only re-emphasize here that great care should be exercised in the preparation and final structuring of the bibliography, and that its style must conform to the practice of the journal where it is to appear.

Other Major Forms of Scientific Reports

The Theoretical Paper. Proper form for the purely theoretical paper is not nearly so well standardized as is that for research reports. The writer of such a paper needs to be ever cognizant of requirements for unity and coherence. He is not recounting some-

thing which occurred—that is, he is not usually telling a story of a sequence of events, as is the writer of a research report. For this reason his task is more difficult and he must be alert for methods of presentation of his argument which compensate for the abstract character of its contents.

This is not to say that he needs necessarily to popularize or oversimplify his form. He does need to remind himself that the reader has probably not shared the intellectual experience from which the article developed. Since this is material less concrete than that treated in a research report, it is, as a rule, more difficult to follow.

It would seem, therefore, that theoretical papers should make full use of guideposts for the reader's sojourn into unfamiliar territory. The more complex the route of an arterial highway through metropolitan territory, the more abundant and obvious the markers should be. The familiar (and familiarizing) technique of (a) telling the reader where he is going, (b) taking him there, and (c) then telling him where he has been is an effective structure for this type of paper. Liberal use of carefully outlined divisions and subdivisions, with appropriate headings, should result in a substantial reduction of those readers who otherwise might become lost or choose to abandon the excursion in favor of a less confused route.

Many theoretical papers could profit from a carefully planned gradation of emphasis. Let the reader have no difficulty in distinguishing the development of an idea from the idea itself. By such methods the reader is paced and motivated to work through the intellectual progression himself. Care in the use of these techniques will reflect back upon the author, because the reader “. . . will be gratified at the smooth working of his own intelligence and will inevitably think better of our theory and of its author than if he had had to puzzle himself over what we mean and then in the end doubt whether he had really understood us, so raising in himself an uneasy doubt whether his brains are quite what they used to be!” (19, p. 4).

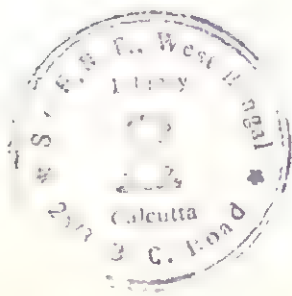
The Review Paper. The typical review paper, such as those which appear in the *Psychological Bulletin* or the *Annual Review of Psychology*, combines some of the features of the research report and of the theoretical paper. New, unreported experiments or data are not included. The purpose is rather to gather together all information pertinent to a well-defined problem or technique in the

field; to sift and evaluate extant studies which bear upon it; to organize the material into a logical development; and, finally, to draw broader conclusions than may be warranted by any one of the studies considered alone.

In order to achieve these ends, discussion of cited studies (especially of good studies) is more extensive than it is in the literature section of a research report. It is completely inappropriate merely to catalogue that "Professor Black found such and such while Professor White found just the opposite." This type of recital is dull indeed—less interesting and no more informative than the abstracts which were probably the reviewer's sole source. Instead the review article must "... achieve integration and survey the literature in a critical and organized manner. . . . The optimal article is one which has the character of a good handbook chapter. It is constructive and critical, and gives an accurate and systematic picture of the present status of methods, results and interpretations in the area in question" (1).

Like the theoretical article, the review needs careful organization and obvious development, since it is not usually recounting a set of events which had inherent organization through chronological sequence. Some typical organization plans are suggested by the following skeleton heads. In actual practice, terms used would be more closely adjusted to the contents of the review.

1. Problem
 - Survey of methods used
 - Survey of results obtained
 - Interpretation—status of problem
 - Areas of needed research
2. The problem area
 - The independent variables
 - The dependent variable
 - Methods of measuring
 - Individual differences
3. Description of the phenomenon
 - Research investigations
 - Applications
 - Relation to other problems
 - Conclusion
4. Introduction—problem
 - The controversy
 - Viewpoint of school A
 - Viewpoint of school B



The critical issues
Resolving divergent viewpoints
Future prospects

STYLE IN THE SCIENTIFIC REPORT

A peculiar ambiguity of terminology lurks in the very place one searches for clarification of the problems of writing. A *stylebook* to an editor is a guide to proper *form*—a problem which we shall discuss in Chapter 7. As a rule, such guides contain little or no aid toward the improvement of style in the sense of manner or mode. Trelease (29) on scientific writing and Fishbein (9) on medical writing are exceptions, since the contents of these books touch on both definitions.

Although there is no absolute dividing line supporting the distinction we have made here, surely two writers could produce their individual compositions from the same stylebook (form), following the rules therein without exception, yet demonstrating a difference in style (mode) as distinctive as their own personalities. Sentence length, choice of words, mood, complexity of sentences, and other variables pertain to the writer's style. In this section we shall consider some of the factors important to style in scientific reporting.

In her telling critique of psychological writing, Katherine Bruner suggests that most of us seem to think there is no place for individuality of style, for freshness in mode of written discourse. Although a psychologist exhibits his enthusiasms and his personality, and even shares his amusing research experiences while talking to his colleagues about his work, when he puts the same thing on paper, Bruner believes, ". . . authors are engaged willfully and with malice in suppressing every vestige of spontaneity and emphasis in what they are writing; and this in order to prove, absolutely prove their devotion to science. . . . Instead of choosing those words as would a strategist, seeking how best to achieve his aim, he bends all his efforts to the paradoxical search for the most colorless expressions, the least pointed, and the most roundabout" (4, p. 53).

Thus has been evolved and inherited a "scientific style" which has been variously referred to as "dull" (4), "dreary" (33), "underbrush," "excess verbiage," "verbosity" (32), "the terrific idea density of the language" (13), "thicket of details" (28), "gobbledygook"

(27), or, in less dramatic terms, just plain "baffling." The writer of this style is alleged to be "tone deaf to words," and "grubby-minded" (32) and his "hidden arrogance" is considered "as a sign of insecurity" (23).

The social scientists, says Williamson, "are merely members of a caste; they are so used to taking in each other's literary washing that it has become a habit for them to clothe their thoughts in the same verbal garments. Nor are they any worse than most of their colleagues. . . . There once was a time when everyday folk spoke in one language, and learned men another. It was called the Dark Ages" (32).

These are harsh but appropriate criticisms. Examples are easily found in nearly any journal, and the many protestations are replete with samples. One of Merrill's, though fictitious, so well illustrates "the scientific style" that we may borrow it as an eloquent warning:

As written in the Bible: "Render [therefore unto] Caesar [the] things that are Caesar's."

As a scientist might have done it: "In the case of Caesar it might well be considered appropriate from a moral or ethical point of view to render to that potentate all of those goods and materials of whatever character or quality which can be shown to have had their original source in any portion of the domain of the latter" (21).

Not all science reporting is this bad, of course, but much of it is no better than dull. Contrary to what some defenders of scientific style maintain, the antonym of "dull" is not "flippant," "folksy," "journalistic," "breezy," or even "popular," necessarily. What writers should strive for, it seems to us, is a manner of scientific reporting which is marked by directness rather than circumlocution, leans toward informality rather than a heavy, literary formality, reflects economy and careful choice of words rather than verbosity and abstract vocabulary, and, finally, shows a sentence pattern with a low mean length and a high standard deviation rather than the other way around.

So much for the complaint. What suggestions can we find for a cure? Suppose we consider the reporting of a scientific experiment as a problem in narration. This is essentially what it is—the story of an attempt to derive the solution of a scientific problem. The plot is simple but "sure-fire": a need, a challenge, and difficulties, followed (according to McKerrow, 19) by the "boost," the "demonstra-

tion," and the "crow." The task in writing narration is to turn the plot into reality, making it seem vital and alive to the reader. The scientist has had an intellectual experience, which, in order to be shared, needs to be retold in at least as exciting a manner as it occurred. Flesch maintains that "only stories are really readable" and that even factual exposition is done best by story telling, "so make sure of character, drama, conflict, a plot and a denouement" (13, p. 60). It can be done in a dignified, learned, scholarly fashion, yet retain enough of the quality of a narrative to hold the reader's interest. The two characteristics most needed in scientific writing in order to achieve such a result are *clarity* and *readability*.

Clarity

Nowhere is clarity, or "the secure conveyance of information" (17), more important than in scientific writing. The great care which has gone into the process of obtaining information should be no less evident in the transmission of that information to others. As just shown, quite a few readers of scientific material have become so disturbed over the lack of this quality of clearness that they have expressed themselves in print, emphasizing one complaint or another. Not many have so systematically and vigorously surveyed the problem of clarity as have Graves and Hodges in their book *Reader Over Your Shoulder* (17). Although this book is not directed specifically at scientific writing, its "principles of clear statement" are scarcely less appropriate for science writing than they are for other creative writing. Their 25 principles and 16 "graces of prose" suggest the following seven questions the scientific writer might profitably ask himself in regard to the clarity of his manuscript.

Is It Ambiguous? Is the referent of each term made known without a puzzling search? The simplest referring words are the most troublesome. If all the who's, what's, where's, and when's are made perfectly obvious, then one of the most frequent difficulties will have been overcome. The ubiquitous "we" in journal articles is a prime example of the error and a target of complaint (5). Never use the editorial "we." In this book you are reading, "we" refers only to Daniel and Louttit, and if you find it used otherwise, consider it as an example of an unclear statement. The unspecific "this . . ." is found with high frequency in scientific writing. Ref-

erence is being made vaguely to what has gone before in such expressions as "this indicates that the results . . .," or "this shows that the subject. . . ." Instead, tell the reader that "this figure indicates . . .," or "this behavior shows . . .," and so forth. Use extreme caution that you do not tax the reader's ingenuity in keeping up with your unspecified or floating referrals.

Is It Exact? Does the word selected have the meaning intended? Most writers have had occasion for surprise when they checked the dictionary definition of a word whose meaning they thought they knew. Prefixes are not infrequently the source of such trouble. For example, Warren (31) protests the use of "disinterested" to mean apathetic. It really means impartial or unbiased, and "uninterested" is appropriate for the intended meaning.

Although scientists have a penchant for quantification and exact figures, there are occasions when they present approximate values verbally. It is appropriate that we ask if the writer and the reader will make the same interpretation of expressions like "by far the greater part," "practically all," "quite a large part," "a considerable part," "a very small part," "nearly all," "almost entirely," and of course many others. To make a simple test of the validity of our question, suppose you assign percentages to the terms just presented, then turn to the end of this chapter for a check on your interpretation.

Is It Tidy? Is the sequence within sentence, paragraph, section, and the whole as orderly as it might be? The reader has a right to expect a continuity of words, thought elements, and thematic development which flows evenly from opening statement to final conclusion. The structure of a typical research report, discussed in the first part of this chapter, represents a plan of logical development which is generally useful for all written discourse. It may be summarized in the steps: problem, attack, evidence, evaluation, conclusion. Any sentence or longer part which does not contribute to the master plan should be re-examined with a critical eye.

Common errors of sequence in sentences include misplaced words and the deliberate use of odd structure for emphasis or variation. Overuse of the latter device should be avoided, since it soon loses its effectiveness and in addition puts a strain upon the reader who is accustomed to the subject-predicate structure of the English language. Certain words, like "only" and "either," seem to get lost

easily within sentences. In reporting data, a student writes ". . . subject's degree of error . . ." when he means ". . . subject's error in degrees. . . ." Still another within-sentence sequence error is the shift of criterion for inclusion of items in a series. Thus a writer reports that his subjects include ". . . college students, high school students, and adults from the middle economic level."

Punctuation is an ally to smooth continuity when used properly, but is most disturbing to the reader when misused. The writer who develops the viewpoint that punctuation is for the purpose of coding transitions between ideas will have the least trouble. Tangential but pertinent idea units are separated by commas when the relationship is close, by dashes when more distant, and by parentheses when most distant. Square brackets enclose clarifying insertions in quotations or summaries where such insertions are made by the quoting writer. Items in series are separated by commas (including one before the final "and"), but by semicolons if one or more commas must be used within items. Thus commas and semicolons always denote parallel relationships. Colons indicate that the succeeding idea unit is "looked forward to" by the preceding unit. Hyphens are used less today for compound words than formerly, but they still serve a useful purpose in linking words where the modifying relationship would otherwise be unclear. For example, if the hyphen were omitted in the expression (from a journal article) ". . . two plate-glass windows . . .," the meaning would be ambiguous. Consider the following as additional examples: ". . . a wax-paper kymograph . . .," ". . . a wall-and-sliding-door arrangement," ". . . an animal 24-hours hungry. . . ."

Linkages between sentences and paragraphs are aided by transitional words such as "but," "therefore," "although," "nonetheless," "so," "accordingly," and others. Some writers have difficulty in selecting the word appropriate to the relationship to be expressed. Scientific articles show frequent misuse of "while" in place of the more appropriate "whereas" or "although," and "due to" instead of "because of." Familiarity with the meaning of these terms and a careful rereading with a mental set for continuity relationships should be sufficient for the elimination of such errors.

The "free association" type of scientific reporting mentioned earlier as a complaint of Sumner is the result of the practice of writing as one thinks, but with the intermediate linkages omitted.

The writer ignores these ideas as obvious, yet the reader finds them mighty comforting. When they are absent, the sequence of ideas appears to flit about in a whimsical manner. No reader should be expected to rearrange ideas or fill in excessively.

Is It Misleading? Does a false relationship between term and context develop misunderstandings? The effort to avoid duplication of terms by the use of synonyms may lead one into false meaning. Since synonyms are never exactly alike in meaning, the reader may become confused as to whether in the second case the writer means to point up shades of difference or is still referring to the same thing. One should avoid the tedious repetition of words, but should not hesitate to repeat them if a synonym instead would be misleading.

The most common source of a misleading statement is missing context. A writer composes his sentences and idea-sequences with a certain mental set, which may not have been imparted to the reader by the previous and succeeding material. Such a writer is blind to the ambiguity, but he may be able to notice it if he puts away his manuscript and reads it "cold" at a later date. Another reader may notice it even more easily. Meaning in oral communication is aided by vocal reinforcements of various kinds. Since these aids are not possible in print, the writer needs extra precautions to avoid misleading the reader.

Is It Economical? Can it be said better in fewer words? Repetition is a very old device in oratory and advertising, but the scientific argument rests upon fundamental validity for convincing qualities. Overdoses of repetition leave the sophisticated reader with the impression that the writer is really in doubt about his point. We are not referring here to redundancy as a device for increasing the probability of an abstract idea's getting through to the reader, but rather to the unnecessary and tiresome hidden repetition so frequently heard in casual conversation. Notice how often one repeats ideas with only slight modification in informal oral discourse. Can-did recordings reveal the phenomena dramatically—the content is strikingly repetitious. Avoid writing as you casually converse, since such communication is uneconomical.

Wordiness is another form of "padding," which is out of place in good writing. Irrelevancies of several sorts will oftentimes emerge in a second reading of one's manuscript and should be deleted. Definitive phrases following a term should be eliminated when no ambiguity

exists for the term itself. Words, phrases, sentences, and whole paragraphs can be found having no close connection to the train of ideas. Weed them out in order to economize.

The scientist's bent toward caution is the basis for our final comment in this category. This attitude may lead to the practice of verbosity and circumlocution, which is so frequently the cause of complaint. To temper one's remarks with a peppering of "probably," "it appears," "it would seem," "provided," "on the other hand," and similar expressions (especially if they tumble over one another in rapid sequence) not only fills up valuable space, but tends to weaken the effectiveness of communication. Say what you believe to be in evidence and say it with the least qualification consistent with good judgment. It is generally understood that experimental results must always be evaluated against the methods used in their derivation, so it is not necessary to remind the reader continuously of this fact. Don't hedge every statement like the psychologist who went so far to protect himself against criticism in a lecture that he eventually referred to "the subject's so-called left hand."

Is It Smooth? Is the reader likely to stumble here and there on rough spots? If so, he will feel he has been treated rudely if not actually blocked as he moves toward his goal. Three sorts of linguistic situations detract from smoothness: sudden shifts, contradictions (apparent or real), and omission of the expected.

If the reader asks himself the question, "Now, how did that come up?" or "Where does that fit in?," it is evident that the writer has introduced a topic too abruptly. It needs some transition. When a preceding discussion is exhausted, the next one may require an introduction (a phrase, a sentence, or even a paragraph) to break the reader's hold on what has gone before and lead him into the next argument. In scientific discourse, more reader adaptability may be expected than in less formal writing, but overly abrupt shifts should be avoided. The same advice holds for the abandonment of a theme. If it isn't worth developing to its logical completion, it usually is not worth including. A discussion which seems to "hang in the air," without getting itself tied down to something familiar or obvious, is one which may be suspected of a too early demise.

Writing is bad when it resembles boxing or football in the use of a feint to the left followed by a quick turn to the right. Such sudden shifts of standpoint delay and disturb the reader. Contrasts

drawn up between things which are not true opposites are distracting elements. False sequence of number gives a lot of trouble, especially when modifying phrases separate subject and verb. When sentences are complex, the writer should go over them, searching out the subject and associating it directly with the verb. This practice should catch most of the inconsistent shifts. Collective nouns are another source of trouble. Be certain that "faculty" or "staff," for example, really refer to the collective group when you use the singular verb or singular pronoun. Avoid shifting from the collective use to the plural use in the same continuity. The word "data" is *not* a collective noun, so it should always be followed by the plural verb form. Shifts of tense are also troublesome. Keep descriptions of the experiment in the past tense throughout, since you are referring to what occurred before the report was written or read. Present tense may be used in the discussion, since you are considering data which are now before you and the reader. Do not juggle back and forth between tenses if you would avoid playing tag with the reader.

Roughness as a result of rank contradiction can usually be caught even in a first rereading. A critical reading by a second person should certainly be directed toward the discovery of contradictions or loopholes in your argument. The implied contradictions are more refractive to correction. When a writer is too eager to avoid repetition and seeks the easy dodge of referring to his subjects, say, with a variety of terms, he invites confusion. Reason tells the reader that these various terms all refer to the same group of subjects, but on the other hand doubt is raised. This kind of writing has no place in scientific reporting, and shouldn't show up even in a first-draft M.A. thesis—but it does.

Finally, the reader will be tripped if he is led to expect something that does not materialize. The dangling introductory phrase, preceding and modifying the subject of a sentence, all too frequently creates an incompleted action. Less elegant sentence structures are more appropriate to reporting clarity. Similarly troublesome is the writer who leads the reader to believe a discussion has been terminated, only to return to it later, apparently expecting the reader to have been unaffected by interference from intervening material. Never put a strain on the reader's memory for new and abstract concepts. If such a structure is required, a reiteration of salient points is also necessary.

Is It Courteous? Does it distract the reader from concentrating upon your meaning content? No devices are appropriate if they lead the reader away from the theme, if they attract attention to words and sounds or other embellishments instead of ideas. Alliterations provide a good example. Did not your attention waver momentarily three paragraphs back over the sentence "Such sudden shifts of standpoint . . ."? Jingles, rhymes, and poetic expressions are best avoided too. Metaphors are sometimes helpful, but use them sparingly. Watch especially for metaphor pairs drawn from divergent sources. Was the caution not to "juggle" and "playing tag" in the same sentence on page 141 so inconsistent as to distract? Perhaps. Certainly figurative and literal expressions mix badly, to the detriment of communication, when ". . . during the interview, the subject sat with her head in her hands and her eyes on the floor."

Readability

Psychologists and others have engaged in considerable research to derive a valid, objective quantification of *readability*. By this term are meant three elements; lucidity, comprehensibility, and appeal. Like the proverbial cobbler's offspring, the psychologist's brain-child goes unshod—devoid of the techniques known to hold good. One cannot go far into the literature of readability without coming across the work of Rudolf Flesch. Although much groundwork preceded his dissertation (published under the title *Marks of Readable Style*, in 1943, 11) he has done more than any other investigator to derive significant measures for the adult reader. Furthermore, from that work has come a continued effort to develop the technique further (12, 14), a series of semipopular treatises, with considerable influence in the applied fields of writing.

Flesch has developed three formulas for getting at different phases of readability. These are not intended to correspond exactly to the three elements just mentioned, but when considered all together they permit a good prediction of readability. Each formula is based upon 100-word, randomly selected samples from the manuscript under consideration. The weights are determined from regression formulas against reading grade placement. In each case the result is a score on a scale from 0 to 100. Formulas 1 and 3 make use of a constant which adjusts 100 to the level of the fourth grade, or

"just literate." The formulas* are here presented in such a way as to apply to a sample of any length.

$$\text{Reading ease} = 206.835 - .846 \frac{\text{syllables}}{\text{words}/100} - 1.015 \frac{\text{mean sentence length}}{\text{words}/100} \quad (1)$$

$$\text{Human interest} = 3.635 \frac{\text{personal words}}{\text{words}/100} + .314 \frac{\text{personal sentences}}{\text{words}/100} \quad (2)$$

$$\text{Abstraction level} = 168.095 + .532 \frac{\text{definite words}}{\text{words}/100} - .811 \frac{\text{syllables}}{\text{words}/100} \quad (3)$$

Formulas (1) and (2) have been modified (12) from the original form (11). Formula (3) is a newer one proposed in order to give more weight to comprehension difficulty (14).

If Flesch is right, and there is evidence that he is (10, 16, 18, 27), the formulas analyze down to a few simple rules which do not guarantee, but should promote, readable writing. Here they are, with some observations of our own tossed in for good measure:

1. Avoid polysyllabic words—like "polysyllabic." Say simply, "long." But use a long word when it is more precise or saves several short ones.
2. Keep your mean sentence length low. The formula doesn't take account of it, but a low mean with a low variability of length is also bad. Variation in sentence length gives relief and interest. The long sentences should march along like a parade, not dodge about like a broken-field runner.
3. Use personal words (like words referring to people or personal relationships) and personal sentences (like quotations, or sentences directed to the reader).
4. Use definite rather than abstract words whenever possible. Although again not considered in the formulas, abstract terms are unavoidable in scientific writing, but they may be relieved and the mean kept low by the device of using a concrete example following a paragraph of difficult relationships.

To what extent do these rules apply to scientific reporting? Should a scientist make an effort to make his writing more readable? Most of those who have written on the subject of scientific

* Formulas (1) and (2) constructed from steps and constants given by Rudolph Flesch in his *How to test readability*. New York: Harper, 1951, p. 4 and p. 8; formula (3) is from Rudolph Flesch. Measuring the level of abstraction. *J. appl. Psychol.*, 1950, 34, 385. Used by permission of the author, the journal, and The American Psychological Association, Inc.

writing think that he should do just that (for example, see Strang, 28). We would surely agree that the opposite sort of thing (pomposity, underbrush—remember?) can never make a report scientific if it isn't basically valid. Flesch himself is convinced that the application of rules like these does not mean talking down, but that your readers will still be with you and will "read you faster, enjoy it more, understand better, and remember longer" (13). None of these features would appear to be detrimental to the best objectives of scientific reporting, as long as the writing is intelligently geared to the audience in terms of terminology and concepts.

Scientific style should be serious—but there should be room for an anecdote if it contributes to understanding or shared enthusiasm. It should be learned and scholarly—but stop short of being pedantic if by that term one means stuffy. It should be accurate and precise above all else—but accuracy and precision need not add up to equal evasiveness and excessive qualification of idea or fact, which are characterized by circumlocution. Scientific style should dictate a manuscript that is brief (and everyone who writes knows this is more difficult than writing a long one), but not so brief that "thoughts are bunched together in tight little bundles" (13). Finally, there should be no stereotyped scientific style which excludes individuality of expression.

A Program for Improvement

Several positive steps may be made by a writer who feels that his own literary efforts could be improved in clarity and in readability. He can spend a delightful couple of hours reading Flesch's *The Art of Readable Writing* (13). After this he will probably dig out some of his old creations and try out the formulas on them. If the scores are low, he *may* take wry satisfaction (along with Stevens and Stone, 27) in knowing his stuff is classifiable as being of "scientific difficulty." (Incidentally, there is one type of writing which rates lower. To sample it get out your insurance policy or read the tax laws.) If the scores on his writing are "fairly difficult" to "difficult," he should take comfort in assuming it was read through by a larger audience and understood better. This paragraph you are reading here is "fairly easy," or about like slick fiction magazines in reading ease. The previous paragraph is "difficult," like a college textbook.

In addition to having his manuscript read critically by a colleague, the scientific writer should seek the honest criticism of an intelligent person educated in a field other than his own. Such a reader should consider clarity, style, and readability. Aside from technical aspects, "material which fails to make sense to an alert and intelligent general reader is material which can be suspected of poor writing and slipshod presentation" (4). It is usually not the writer's professional terms and concepts which give trouble, but "poor writing like good football is strong on razzle-dazzle, weak on information" (21, p. 73). Writing directed to a person has a more pleasing style than that written for some disembodied "scientific archive" and is more likely to be understood by the scientist and intelligent layman alike. Try selecting your critic before you write, then address your narration to him personally.

Good outlining will usually mean good planning and good design for the report. Of course, outlines may be altered as the work progresses—as new ideas occur. But if these late ideas are "tacked on" without proper consideration of the effect on a master plan, the result will be disappointing. The report, as well as the experiment, deserves a prearranged design.

Some improvement may be expected by practicing a satisfactory style all the time—in all your writing—not just when you prepare an article for publication. Make a note of the specific suggestions made in this book which impress you: Add others from Flesch (13) or Bruner (4), Merrill (21), Hebb (18a), Williamson (32), Strang (28), or one of the other books we have mentioned (9, 17, 29). Review such ideas before you write *anything*—a letter, a term paper, a protocol, or a note to the milkman.

Some Controversies of Style

Person. Most scientific reporting is done in the third person exclusively. The author refers to himself as "the experimenter," "the writer," or some such non-personal term. The basis for this long-standing practice is that it contributes to objectivity. Whether or not it actually does so is a matter of some doubt. It can if the writer is otherwise likely to be an overuser of "I" and "me." It won't help if he has a non-objective story to tell.

Opponents of the third person style point out that it is artificial, puts the whole process on too formal a level, and may be misleading

and confusing to the reader. Certainly a few psychological writers have successfully reported in the first person. But, for the novice, some practice with good critical reading by an outsider ought to be the rule before he abandons the third person in an article to be submitted to an editor.

Voice. Much of a typical scientific report is in the passive voice, e.g., "The subjects were directed by the E to . . .," and "The data were treated by the chi-square technique. . . ." These are familiar expressions. Active voice is less heavy reading, more expressive, and just as easy to write. It also permits more liberal use of personal words, thus raising the human interest score and contributing to readability.

Simplicity. Scientific writers oftentimes strive to be as technical as possible. No doubt this practice satisfies an ego need. Although a certain degree of technicality cannot, and need not, be avoided, an overdose is plainly evident to the professional reader. If a statement is just as clear in non-technical language, choose that mode, for it will be more widely understood even among your specialized colleagues. Again we point out that most writers on the problem of style have emphasized that writing is better when directed to the intelligent reader, not necessarily the specialized one. Notice the style achieved in the journal *Scientific American*. It is no less scientific for being less technical. Writing *can be* more forceful, clear, and readable.

Humor. Humor is rarely found in scientific reporting. Surely there is no place here for flippancy or mere entertainment. However, a few writers have declared themselves in favor of its cautious use and about as many have actually used it successfully. Bruner (4) deplores the belief of men of science that it is beneath their dignity to employ humor to help their reports to be more readable. To be effective and acceptable, humor must be clearly related to the main purpose of the report, it must be presented in good taste, and it must not detract from the continuity. Undoubtedly, if carefully handled, an occasional humorous remark or anecdote may serve to clarify a point or relieve a heavy section. In the psychological literature it will be found most frequently and effectively in the *American Psychologist*—and he is a pretty funny fellow, at that.

* * *

Per cent equivalent for verbal expressions
of quantity (see page 137)

100	all	40	a large part
99	practically all	35	quite a large part
95	almost entirely	30	a considerable part
90	nearly all	25	part
80	by far the greater part	15	a small part
70	the greater part	10	not much
60	more than half	5	a very small part
55	rather more than half	1	an inconsiderable part
50	half	0	none
45	nearly half		

SOURCE: Graves and Hodge (17, p. 140).

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CHAPTER 7

Manuscript Preparation

Discussions in the previous chapter emphasized general structure of the principal forms of scientific reporting and, in addition, some problems of style (defined as manner or mode of writing). In this chapter we turn our attention to many of the minutiae of style (defined as form). We have in mind here problems encountered by the writer who has his rough draft finished, knows fairly well what he wants to say and how best to say it, and is ready to "polish up" his manuscript in order that it will conform to acceptable practice.

Finished manuscripts may be classed into two kinds in terms of the purpose for which they are prepared. Because there are differences in the mechanical details of the two sorts, it is necessary to keep the purpose in mind during preparation. The first group, which we shall call *final manuscripts*, are those which are in themselves the final product, and as such are intended to be read. This class would include term papers, class and seminar reports, theses and dissertations for advanced degrees, administrative surveys and reports, research reports for internal use, and the like. Manuscripts prepared for reproduction by photographic processes, e.g., photo-offset printing or microfilm, should also be included because the final product will be in exactly the same typography as the original manuscript. The second group, which we shall call *copy manuscripts*, include those prepared as copy for printed publication, thus involving the intermediate steps of the various printing processes before being presented to the reader.

It would seem reasonable that the number of different rules governing form for a particular problem should be kept to a minimum. This would mean that, insofar as possible, the form guide should apply to both final and copy manuscripts. With this principle as a

basis for the chapter plan, we shall devote most attention to those considerations applicable to both types. Where necessary, practice applicable to one form only will be pointed out.

PLANNING THE FINAL DRAFT

Paper

The size of paper sheet most frequently used for manuscript and letterhead is $8\frac{1}{2} \times 11$ inches, and this size should be used under all ordinary circumstances. Legal documents are frequently prepared on a special, large-size sheet $8\frac{1}{2} \times 13$ inches known as legal size. These sheets should be used only for special purposes, for they are inconvenient for both final and copy manuscripts.

Paper quality is determined by the method of manufacture and content, and by the weight. For manuscript use we will mention only mimeograph, sulphite bond, and rag bond papers. Mimeograph paper is a soft-surfaced, absorbent sheet designed for use in mimeograph reproducing machines. It is available in several degrees of quality and in several weights. It is relatively inexpensive, but it should be used only for preliminary drafts and never for final or copy manuscripts.

Bond paper is a hard-surfaced sheet with limited absorbing characteristics. In common use is sulphite bond, manufactured from wood pulp by the sulphite process. It is available in many qualities and weights and is the preferred paper for copy manuscripts and for most final manuscripts. Because of the nature of the manufacturing process, sulphite bond paper cannot be considered to have a permanent life. Therefore, in special cases, where permanence over many decades is an important desideratum, rag bond paper should be used. Because of its expense, rag bond paper need not be used for copy manuscripts, and it is desirable for final manuscripts only under special circumstances.

The thickness or heaviness of paper is indicated by its "substance weight," or simply "substance." The common weights used for manuscript paper are 16, 20, and 24 pounds. These figures represent the actual weight of one ream of the paper in the standard size of manufactured sheet, e.g., 25×38 inches. For carbon copies a 12-pound sheet may be used, but this is too lightweight for manuscript use. For copy manuscripts, term papers, and other reports, 20-pound

bond is satisfactory. For dissertations which will be bound and used as books, 24-pound is preferred. Although paper may be had in a variety of colors, only white should be used for manuscript purposes.

Typewriting

Typewriters are so universally available today that manuscript preparation involves their use to the almost complete exclusion of handwriting. There are a number of type faces to be found on typewriters, but every standard machine is one of two sizes—pica or elite. Pica type allows ten characters to the inch, whereas elite allows 12. Thus a given length of typed line has 20 per cent more characters in elite than in pica type. This difference is important in estimating the number of words on a page.

This line is set in pica type.

This line is set in elite type.

Before the final typing of a manuscript is started, the machine should be cleaned, especially the type, so that similar characters such as *a*, *e*, and *o*, or 3 and 8 may make clean, clear impressions. The ribbon should be sufficiently inked to make sharp, easily read letters. In general, typing should be double-spaced; margins should be ample and so proportioned that the typed page is pleasing in appearance; formulas or other irregular matter should be carefully and accurately typed; there should be no, or a minimum of, corrections; headings should be properly spaced; in short, the finished product should provide the maximum in reading efficiency. Under ordinary circumstances, only one side of the page is used.

Type Page

All margins should be a minimum of one inch—more is better. A six-inch line (60 characters in pica, 72 in elite) and 25 double-spaced lines per page will give ample margins for nearly all purposes and results in a word count very close to 300 per page of elite and 250 per page of pica type. Five spaces of indentation are used at the beginnings of paragraphs. Except for quotations, all other lines should begin flush with the established left margin and be as nearly uniform on the right margin as possible. An experienced typist can appreciably reduce irregularity in line length. A final manuscript

which is to be bound along the left edge should provide about a quarter inch wider margin on the left than on the right.

Spacing

Everything in copy manuscripts is typed double-spaced without exception in order to provide adequate space for corrections, editorial markings, and the like. This rule applies to all parts of the manuscript—bibliography, heads, tables—*everything*. In final manuscripts, double-spacing should be the rule for text material, except perhaps for very short manuscripts. When single-spacing is used, there should be double-spacing between paragraphs. Single-spacing of footnotes, bibliography items, long quotations, and certain descriptive material is permissible.

TEXT PRESENTATION

Title and Author Identification

Titles for copy manuscripts are typed at the top of the first page of text. Major words are capitalized, and each line is centered. There are four different situations encountered in identifying authorship and location: (a) one author, (b) more than one author, all from the same institution, (c) more than one author, each from a different institution, and (d) more than two authors, two or more of whom are from the same institution. The following examples indicate proper form for the four cases:

- (a) George Johnson
University of the East
- (b) Henry Blackmore and George Johnson
University of the East
- (c) William Smith
University of the South
and George Johnson
University of the East
- (d) Henry Blackmore, George Johnson
University of the East
and William Smith
University of the South

Notice that lines are centered, capitals and lower-case style is used, and double-spacing practice is followed here as throughout the manuscript. In final manuscripts, titles and institutional connections may be presented in the same manner as for copy manuscripts. However, many specific kinds of final manuscripts (e.g., theses and dissertations) require a separate title page in the manner of a title page of a book. One should consult local practice for the exact form to be used.

Headings

Through the careful use of headings and subheadings the organizational outline of the article is revealed to the reader. For most purposes three or possibly four levels of heads are optimal. The shorter the manuscript, the fewer the levels ordinarily required. Any further breakdowns make for difficulty in following the subsumed relationships. Whatever the heading plan may be, it should bear a close resemblance to the final prewriting outline. Books present so many problems of organization that details of headings must be left fairly flexible. A good scheme for journals—the one adopted for the APA journals (*A 159*)—makes use of the following four orders:

- Order I. Centered and typed in capitals and small letters. Major words begin with capitals.
- Order II. Centered and typed as in Order I, but also underlined.
- Order III. Placed flush with left margin, typed and underlined. The paragraph which follows begins on a new line with paragraph indentation.
- Order IV. On the left, but with paragraph indentation. Typed and underlined as in Order III. The paragraph follows on the same line.

Only Order IV heads are followed by a period. Each of the others has no punctuation at the end. Authors are advised further: (a) when three levels are sufficient, use Orders I, III, and IV; (b) when two levels are sufficient, Orders I and IV are preferred, although I and III may be used; (c) if one will suffice, use Order I. Numbering or lettering of heads is not used unless facility in cross-reference is a desideratum.

Style of heads has not been standardized to a degree which would

permit us to specify a set of rules applicable to all journals. One must check the journal to which one's manuscript is to be sent. Since the printer has a greater variety of type styles than is found on the typewriter, special instructions must be made if these resources are to be used. Single-underlining in copy manuscripts always indicates to the printer that the material is to be set in *italics*; double-underlining indicates small capitals; triple-underlining means all capitals; and a wavy underlining indicates boldface. If a greater variety than this is necessary, directions to the printer can be written in the margin. Usually matters of type style beyond capitals and italics are left to the editor, who will mark the manuscript to conform to his particular journal style. In order to facilitate the editor's task, the author should avoid typing any word all in capitals.

In final manuscripts one may make use of whatever limited methods are available on the typewriter one is using. However, the APA plan, just outlined, is a good one to follow. Special situations may dictate modifications and variations. For example, it would be undesirable in this book to use fourth-order heads in italics because in some chapters paragraphs often begin with an italicized journal or book title. In any case, the important consideration is clarity, supported by its most potent weapon—consistency.

Making References

A number of methods are used to indicate in the proper text position a reference to a citation in the bibliography or list of references. The first to be mentioned, and the most popular, is to use the serial numbers from the itemized bibliography. Superior numbers are sometimes used, although it is perhaps more acceptable to use this form when reference is to footnote material. The commonest usage in psychological literature is to enclose the reference number in parentheses immediately following the author's name if that is mentioned in the text. In a sentence where the author's name is in the possessive, it is better to place the reference number immediately after the thing possessed, for example, ". . . Smith's work (6) is . . ." If the name is not mentioned (but it usually should be!), the number is placed in such a relation to the significant word that a relationship is evident. Reference numbers enclosed in parentheses may be printed in the same typeface as the text, but editors sometimes mark them for printing in italics or boldface so that they are

not confused with similarly enclosed numbers which do not refer to bibliographic citations. This method of reference has been used in this book and illustrations are abundant in the psychological journals.

A second method of referring to the bibliography is used less frequently, but there are logical reasons for it. In this method the list of references is arranged alphabetically, but the date immediately follows the author's name and no serial numbers are used. In the text the reference is made by enclosing the date in parentheses immediately following the author's name. In cases where the same is not given in the text, it must be included in the parentheses with the date. If two or more references are made to the same author in the same year, they must be distinguished by a letter following the date, thus: "... Smith (1950a). . . ." The best argument for the date method is that the reader knows immediately the recency of the work referred to. Further, if the reader is thoroughly familiar with the literature in the field, he may be able to identify a specific paper or book by the date.

Whichever of these two methods is used, certain variations should be noted. If it is necessary to indicate a page number (e.g., when quotations are made), it follows the reference like this: (21, p. 425). Two or more references may be made within the parentheses, thus: (21, 49) or (1937, 1943). A quotation of appreciable length, especially one which is set off by a smaller type size, usually has the reference following it, e.g.: "... covers the most frequently found situations" (8, p. 302). Reference parentheses are included within the sentence without special punctuation; at the end of a sentence, clause, or phrase they precede the comma, colon, semicolon, or period, but they follow the quotation mark or question mark when such a mark is needed (see the form in the preceding sentence). Make sure that the reference list is complete and in proper order, with serial numbers assigned, before typing any reference numbers in the final draft.

References to tabular matter are written in the following manner: "... results in Table 1" "... see the second column of Table 3" and the like. The word "Table" is capitalized and the Arabic numeral is preferred to the Roman. A similar system is used for graphs, which, along with charts, diagrams, photographs, and other illustrative material, are all called "Figures"; again the

word is capitalized, and used with Arabic numerals. APA practice permits the abbreviation "Fig." in text references. We believe this to be undesirable unless "Table" should become "Tab." Tables are numbered consecutively in one series and figures are numbered consecutively in a separate series.

Quotations

Direct or verbatim quotations are presented within the text but are set off by being enclosed in double quotation marks. Any sentence terminating in both a period and a quotation mark must show the period preceding the quotation mark. This may not always appear logical, but it is a firmly established typographical custom. Single quotation marks are used only to surround a quotation within a quotation. Double quotation marks are used around single words or phrases of a colloquial or figurative nature. In a way, these are direct quotations from the writer's mode of oral communication, and are frequently helpful in clarifying a point even in written scientific reporting.

These rules pertain to brief quotations ranging from a maximum of two or three sentences down to a single word in length. When a quotation is about three sentences or longer, it should be set off in some manner to distinguish it from the regular text. The smaller type and (sometimes) extra indention given quoted material in print may be simulated effectively in final manuscripts by being typed single-spaced in lines approximately 5 in. long, thus being indented right and left by about five extra character spaces. Quotation marks are not used.

An extensive quotation in copy manuscripts is typed double-spaced and full line length, just like the rest of the text. Do not use quotation marks. However, be careful to keep the quoted material in a separate paragraph—do not allow the initial or the terminal sentence to appear on the same line with non-quoted text. Write the word "quotation" in pencil in the margin and draw a light pencil line along the margin for the full length of the quotation. This procedure will facilitate the editor's task in marking manuscript for the printer.

When a word or words are omitted from a quotation, the omission is indicated by three periods (called an ellipsis). If this comes at the end of the quotation, four periods are used, the last one indicat-

ing the "full stop." Insertions by the quoting author for clarification are indicated by square brackets. Typewriters ordinarily do not have these characters, so they must be added by hand.

Footnotes

Extensive use of footnotes is to be avoided in good scientific reporting. Literary style provides for frequent asides, which cover incidental comments, illuminating anecdotes, documentation, cross-references, and the like—most of which are unnecessary and usually disconcerting to smooth perusal of the article. Every scientific writer who finds himself tempted to use footnotes throughout his text should read Frank Sullivan's amusing parody (4) on the subject. Upon critical self-examination, he will usually find that he can omit the footnote, embody it in his text, or otherwise dispose of it. One method is to collect all such marginalia into an appendix at the end of the article, where they will not serve to trip the reader. The necessary footnotes at the beginning of an article are not subject to this criticism, since the reader at that point is not engrossed in the thought content of what he is attempting to digest.

Should footnotes be absolutely indispensable, their point of reference in the text is indicated by superscript numerals. The footnotes are numbered to correspond. Numbering of footnotes should be continuous throughout a single article, or chapter of a book. In certain special cases, e.g., tables or mathematical text, superior numerals may be confused with exponents. In such situations, superior letters or printer's marks (*, †, ‡, §, ||, ¶) may be used.

In final manuscripts the footnotes are typed at the foot of the page where reference to them is made. The typing of each page must be planned in such a way as to make adequate provision at the bottom for all notes within that amount of text. They should be typed single-spaced, with double-spacing between notes, and they should be separated from the text by a straight line drawn below the last typewritten line.

As in final manuscripts, superscript numbers are typed in the text of copy manuscripts, but the footnotes themselves are usually not placed at the foot of the page. Rather, they are all typed together on a separate sheet or sheets as needed. Be sure to number properly and separate them clearly from each other; also there should be clear indication of the location in the text so that the printer may locate

the footnote on the proper page. Some editors will accept manuscripts with footnotes typed in the text on a line or lines immediately below the line in which the reference is made. If this form is used, the footnote should be separated from the text by full straight lines drawn above and below it. A few editors will accept footnote treatment as described for final manuscripts.

Numbers

Numerals are generally used for values over ten. In most journals the spelled-out word is used for ten and under *except* (a) when the number is one of any series of numbers, (b) when it is a page reference, (c) when it is used in a parallel relationship to a numeral in the same paragraph, (d) when it is a score or percentage, and (e) when it is identified by an abbreviated quantity term (e.g., "3 SD"). In each of these five cases the Arabic numeral is used. In most other cases the word is used, as in the example in the preceding sentence. In addition, numerals must always be used for calendar dates, time, bibliographic or other reference numbers, and of course values entered in a table or figure. Arabic numbers are generally preferred to Roman, although the latter are used in a few instances (e.g., to differentiate subtitles in a series of articles). Avoid beginning a sentence with a numeral. Rephrase the sentence if possible; if not, spell out the numeral.

It is best to spell out rounded or approximate numbers regardless of their value. Readers must not be misled regarding such numbers—they should be clearly identified as approximate in addition to being spelled out. Especially should great care be exercised in showing digits beyond the decimal point. Make certain that there is experimental and/or statistical justification for the apparent refinement indicated by a small decimal value. Numerals in a set, as for example a column in a table, should all be carried to the same decimal place.

Formulas

Except in the case of typewriters having special mathematical keyboards, it is sometimes difficult to handle mathematical symbols or formulas on the typewriter. If the formula includes symbols involving only common letters and exponents, it can be typed as a regular text line. If fractions are involved, a neater job can be made

if the typist will turn the platen halfway so that the text line is lined up with the dividing line of the fraction. In the case of very complicated formulas it is probably better to type them centered on the page between lines of text.

Signs of subtraction and multiplication are made with standard typewriter characters, a hyphen for the minus sign and a lower-case "x" for the multiplication sign. The sign for division may be made by striking a colon, back-spacing, and striking a hyphen in the same place. If the typewriter does not have the plus sign on the keyboard, one may be made by striking the single quotation mark over a hyphen. The slash (or diagonal) over the hyphen should not be used, since it produces an awkward appearance. The best method is to use the hyphen and add the vertical cross line by hand. Unless the typewriter has the other special characters needed in formulas, such as sigma, square-root sign, integral, and so forth, they should be carefully made by hand, using India ink.

Statistical formulas are commonly identified by marginal sequence numbers in standard textbooks on the subject. This provides a simple, economical means of avoiding reproduction of the formula (an expensive and space-consuming luxury), thus: "Guilford's formula (7) No. 55 was used in obtaining the correlation coefficient." For statistical devices which are very common (for example, those which might be taught in a standard course in psychological statistics) neither reference nor reproduction is necessary.

Like tabular matter, mathematical formulas make difficult and expensive composition in print. Except for simple single-line formulas they usually require special handling. Unless the paper is on a mathematical subject, it is usually possible to avoid the use of formulas. If the formula is new, modified, or obscure, its inclusion is justified. If formulas cannot be avoided, they should be typed or hand-lettered clearly so that the compositor knows exactly what is needed. Set them off by adequate space from adjacent text matter.

Abbreviations and Symbols

It has been said that the publication problem in psychology and in social sciences is in part a matter of the lack of symbolic shorthand, which results in tremendous reporting bulk. Although this may be an overstatement, it is nevertheless true that we could economize more than we do. Psychologists have many commonly understood

abbreviations, which should be employed without explanation or identification in the professional literature. There are considerably fewer symbols, and most of those we use are borrowed from other sciences—statistical symbols and a few from biology are well known among psychologists. Of course, the generally used symbols are also used by psychologists, and they are so familiar that there is no need to catalogue them here. A comment is in order concerning the use of the symbol for “per cent.” Whether the symbol, %, or the term is used, it should always be preceded by a numerical value. When a value is not given, the word “percentage” is used. Notice the form of the two words. Journal editors differ in regard to the use of symbols such as %. Consult the journal concerned before typing a final draft.

For the statistical symbols, Dunlap and Kurtz (*A 178*) and Kurtz and Edgerton (*A 180*) present lists of standard symbols and definitions. Both of these books are cited as guides for accepted form by the Council of Editors for APA journals. Casual examination of statistical symbols in journal articles and books indicates that as yet there is no fully accepted standardization.

Certain widely used tests, such as the Rorschach, MMPI, Strong, and others, make use of symbols or abbreviations to indicate part-scores, or subtest analyses. In articles reporting research on these tests or making use of test results, these symbols may be used without definition. It is customary to underline the symbol or abbreviation in order to set it off clearly from text matter.

Abbreviations are probably used more extensively than are symbols. Psychology is not far behind government practice in the use of initials for long terms. Many of these are so generally understood that they should be employed without explanation. Less well known terms must be identified the first time they are used in a scientific report; the abbreviation alone may be employed thereafter. If more than a few new abbreviations are glibly tossed at the reader in an article, he needs more than a single identification of the meaning of each.

An example of such confusion is the common practice of identifying groups of subjects as “control,” “experimental group I,” and “experimental group II,” or sometimes merely as “group I,” “group II,” and so on, often for many compounded subgroups. A better practice for the reader’s ease of following is to use some single key word which identifies the unique characteristic of each group or condition.

This practice is especially helpful to the reader when he examines a table if such a clue is provided so that he does not have to go back a page or so to remind himself that "group II Ss were administered 2.0 cc. of tetraethylammonium chloride, group III Ss were given 2.5 cc., and group III Ss 4.0 cc. . . ." A clearer method is to say throughout "the 2 cc. group" and so forth.

In certain systems within psychology (notably Kantor, Levin, Hull) unique sets of abbreviations have been developed. It is an equivocal matter whether these are sufficiently understood in the field as a whole to be used indiscriminately without identification.

Appendix D is a classified list of those symbols and abbreviations which writers should feel free to use without the necessity of explanation in articles appearing in the psychological journals. It should certainly not be considered an exhaustive list, however. Whether are not abbreviations and symbols will be used freely is a question which each author must decide for himself for final manuscripts and which the editor will decide for copy manuscripts. We wish to call attention to the fact that though text sections might appear cluttered if there is overuse of abbreviations, they still may be employed to advantage in tables, figures, protocols, and other detailed or condensed forms of data or procedure presentation. It is important that the writer be consistent (within a well-defined section of his report) in the use of such shortcuts.

Punctuation and Capitalization

The rules for correct punctuation and capitalization in the English language are too extensive to be reproduced here. A writer in doubt should consult one of the many guides available on the subject. Several good ones are cited in Appendix A (A 51-53), and any librarian will have something of this kind available. At the final-draft stage of manuscript preparation, the reader might review our general treatment of punctuation in Chapter 6. We have also considered some of these details in connection with the preceding discussion of quotations.

Special care should be taken in regard to the correct form for compound words, since they seem to give some trouble to writers of scientific material. A general rule worth remembering is that compound terms which are familiar in psychological literature are not hyphenated. To this rule there are some exceptions: Use the

hyphen when (a) the word would mean something different without it, (b) the root word is a proper name, (c) the root word begins with the same vowel as the terminal letter of the prefix, or (d) the vowels on the two sides of the hyphen would otherwise form a diphthong. Hyphens are also used in a series of compound words with a common root when the root is postponed until the last term, thus: ". . . first- and second-year progress. . . ." Fractions which are spelled out, like ". . . five and one-half feet long . . . ," use the hyphen. The prefix "self-" is usually followed by the hyphen.

Capitalization also involves a great many rules which will not be repeated here. In the psychological literature, titles of books or journals, tests, institutions, and persons are the terms which may give trouble. Whenever a rule states that a word is capitalized, this means that only its first letter is made a capital. The other situation is indicated by the expression "all caps." Every major word of a book or journal title is capitalized in the text, but only the first word is capitalized in a citation.

Official titles of tests appear with every word capitalized including the word *test*, *scale*, *inventory*, *schedule*, *form*, or other similar term, provided such a word is actually a part of the title and not merely a general term of identification. The same principle applies to institutions and persons. When addressing or referring to a particular institution or organization by its official title, capitalize the words in the title. A person's title is capitalized when it precedes the personal name or is used otherwise in an address. For either institutions or persons, apparent titles are often really descriptions, in which case they are not capitalized.

Mechanics of Emphasis

The writer will render great service to his readers if he makes gradations of emphasis rather obvious. Restatement and repetition are style devices for producing emphasis. Variations in sentence structure—marked by the use of parentheses, colons, semicolons, and the dash—also give emphasis and contrast. Typographic devices such as the use of italics, boldface, different type sizes, and the like are useful if not overdone. It should be remembered that these devices work effectively through contrast and too much of something different reduces its effectiveness.

Bibliographies

In Chapter 4 we described the acceptable form for bibliographic citation. That form should be followed unless specific requirements dictate an alternate procedure. Bibliographic material, regardless of the type, should be arranged as a single list placed at the very end of the total text material. In the case of a long manuscript where the major divisions are chapters and where the chapters treat of different subjects at least to the degree found in ordinary textbooks, the bibliography (or reference list) may be placed at the end of each chapter. Literary style, which requires that citations be given in footnotes, is not generally found in scientific reporting of any type. In final manuscripts, double-spacing is used between reference items and single-spacing within the item. Two- or three-space indention, beyond the beginning of the first line, is used for subsequent lines of an item.

In copy manuscripts, as in final manuscripts, no other material should appear on pages containing the reference list. A few journals either require or permit footnote placement of bibliographies, although such form is decreasing in popularity. Double-space throughout the reference list, within as well as between items. Carefully check the journal to which you will submit a manuscript to be sure that you have followed its regular form. Most editors prefer to make their own markings for special treatment by the typesetter, so do not "commit" any portion of a citation to any particular typographic form, other than the underlining required for journal and book titles or other details described in Chapter 4.

Appendices

Certain material of a reference nature belongs in an appendix rather than the text of a scientific treatise. Examples are tables in statistics books, raw or intermediate data or copies of forms used in theses or dissertations, and the various reference materials supplied at the end of this book. Appendices are not required for ordinary journal articles. They are sometimes needed for monographs. Their location is usually after the text but before references or index. Any detail of form or structure in the appendix can usually be supplied from discussions of text or data presentation.

DATA PRESENTATION

Data are usually presented in tabular or graphic form. The ability to construct and interpret these forms is considered to be an important part of the scientist's early training. From the undergraduate laboratory report on through graduate theses, journal reports, and textbooks, tables and graphs present difficult problems of clear communication. One need not search very far at any of these levels of sophistication to find some examples of poor structure. Economy balanced with clarity is the major objective in tabular and graphic forms. This consideration emphasizes the need for careful planning and craftsmanlike execution in order to exploit the medium effectively.

Tabular Matter

Tables can be adapted to fit many different situations where condensed, detailed, organized, and precise information must be presented. This versatility makes difficult the task of treating tables comprehensively. We shall confine our discussion to the most common problems and refer the reader to guides (3, 5) where a great many suggestions may be found.

Planning the Table. A little care in planning the table is rewarding in improved final appearance and in preventing numerous revisions. Size and shape are gross aspects influenced both by the material to be included and the space into which it must fit. The planning should also include consideration of general appearance. Either a square or a rectangle (about 50 per cent greater in one dimension than the other) is a more acceptable shape than one which resembles a high chimney or a long fence. If content suggests either of the latter shapes, it can be avoided by the "double section," which simply means making two or more duplicate tables (under a single title) either side by side or with one section under the other, as the situation requires. In final manuscripts, the standard $8\frac{1}{2} \times 11$ inch page becomes the frame into which the table must be fitted, and in copy manuscripts the journal page size and format are influencing factors.

Since in either case the author prepares a typescript copy, he must plan in terms of the typewriter's limitations as well. This means

especially that entries cannot be "squeezed" into a small area. Every unit (letter, punctuation mark, or spacing) requires the same amount of space as any other. Table column width must be planned to provide for the longest entry to be included, and row height planned for the greatest number of lines which will appear anywhere in the row. A table must not become so crowded that entries intended for one category extend over into another, or even into the space (or line) which separates categories. Plan a table by "roughing it in" by hand, noting arrangement of heads, required heights and widths, and other details on the draft. Although a good table should look uncrowded, it should not have too much space between categories or it will be more difficult to read. Two to four typewriter spaces between the widest entries should cover most situations.

The arrangement of columns and rows can usually be such that important comparisons are the easiest for the reader to see. Systematic development of sequence within the table is necessary for greatest clarity. With only slight modification, the basic rules of good verbal communication can be applied to the table as well. For example, a table should certainly have unity (a central theme), coherence (orderly arrangement), and emphasis (important data placed last, or set in heavier type). Data in sequences are usually placed to be followed down columns, data in categories usually across rows.

First choice for table position is one which makes possible a reading of the table without turning the page. Second choice is that table which requires a 90° clockwise rotation of the page. A very long table may force the third choice—a table continued on the following page. In the multi-paged table, the notation "table continued on the following page" is placed appropriately as a footnote and that portion which is carried over requires repetition of the word "table" and the number, followed by "(continued)." The title is not repeated, but the boxheads and stub must be duplicated. Sometimes in final manuscripts and very rarely in books or journals, the folded insert table may be found. Both of the last two styles should be avoided if at all possible.

Structure of a Table. The major parts of a table are the title, headnote, boxheads, stub, body (or field), footings, and footnotes. Not every table will have all these parts, of course, and any part

may need to be more elaborate in one table than in another. We shall discuss briefly the most important considerations in each of these parts.

The table *title* should identify the major information contained in the body of the table and should do so with clarity and good structure. The principles applicable to the writing of a report title are also appropriate here. Attractiveness is less important than in the article title, but brevity is surely desirable. Explanations belong in the text discussion, not in the table title. One should not use a title which begins "Table showing . . .," since such a statement is ridiculously redundant.

The identification, "Table 1," is centered above the title. Arabic numerals are used, with the numbering being consecutive throughout the report. The title is also centered. If more than one line is required, each should be centered, with each successive line made shorter than the preceding line. This style is known as "inverted pyramid." Capitalize major words and omit the final period.

The *headnote* is for the purpose of providing detailed information pertinent to the whole table. Probably the case most frequently found is a statement of the *N* in the group from which the data were derived. Credit to someone else for the data, when required, may be given here or as a footnote. The headnote should be placed between the title and the table proper. Only the first word should be capitalized. Some editors prefer that the headnote be placed inside parentheses.

The *boxheads* are the spaces at the top of the columns together with the identifying terms they contain. The smallest unit is the single column head, and there may be one or more orders of *spanner heads*, which extend across more than one lower-order head. Spacing of the boxheads should be generous for greatest clarity; brevity is desirable and may be achieved by (a) omitting periods, (b) using singular terms whenever possible, (c) using standard abbreviations when you can (see Appendix D), and (d) using table footnotes where brief heads are not sufficiently revealing. Only the first word in each separate head is capitalized. Heads must be centered over the column or column heads which they identify. The unit for numerical entries down a column *must be identified*, and this is usually best done in the head. Some examples frequently found in research

reports are *ms*, *sec.*, *min.*, *score*, *percentile*, *frequency*, *%*, and *number*. Never—absolutely never—report data in a table without identifying the unit of measurement.

The *stubhead* is the identification in the upper left corner of the table. It pertains to all of the row identifications which fall in the column below it. This space should not be used to identify a series of column heads—use a *spanner head* instead. In the *stubhead*, use the most specific term applicable to all of the captions in the stubs below. If these are very heterogeneous, use the term “Item.” The *stubhead* entry should be made consistent in style and form with the *boxheads*. All entries in the stub and in the *boxhead* should read horizontally. Vertical entries, when absolutely required, should always read up, not down.

The *field*, or main body of the table, is made up of cells into which data entries are placed. Each cell is identified by both a column and a stub label. Therefore consistency across as well as down is a necessity. Do not allow any sudden shifts of viewpoint or reference to occur in either direction. Sometimes a large block of cells needs to be separated from another large block. The necessary shift of reference is accomplished by the use of a *field spanner* which cuts across columns but does not nullify column heads. Field spanners are usually neater than an arrangement of stub spanners.

Lines (called *rules*) are ordinarily drawn in vertically to separate columns and horizontally to enclose *boxheads* or sometimes to separate large horizontal sections of the field. They are usually not required to separate each row from the next one. Very simple tables may not require rulings at all. Some editors prefer that no rulings be made in copy manuscripts; others accept lightly pencilled rulings made by the author. Tables in final manuscripts should be ruled neatly in India ink with a draftsman's ruling pen. Side, top, and bottom rules should be placed at the proper distance from the column, row, *boxhead*, or footing they limit, but they should be joined to form a continuous frame for the table exclusive of title, *headnote*, and *footnote*.

Footings are enclosed within the outside frame, but they may be separated by a single line from the last preceding row if no rules have been used for individual rows, or by a double line if such individual separations have been used. Many different *footings* are to be

found, but the most common are the stub labels "Sum" (Σ) and "Mean" (M). Such an entry is indented a few spaces to the right of the stub margins established above it.

As previously mentioned, superscript letters or printer's marks are used in the body of a table at the point of reference to a footnote. It has become common practice to use the asterisk as the reference symbol to the footnote "° Significant at the 5% level of confidence" and the double asterisk for "°° Significant at the 1% level of confidence." These symbols should not be used for another purpose in tables where such explanations as just given have any pertinence. Table footnotes are placed directly beneath the last horizontal line (rule) of the table, indented to the same degree as the stub.

Special Considerations. In all copy manuscripts and in most final manuscripts, each table should appear on a separate page. An exception for the final manuscript is a very small table, which may be arranged on the same page with text matter. For copy manuscripts it is especially important that the rule be followed, since composition in the printshop involves a different process and may be carried out simultaneously with the linotype composition of textual material. The author can best indicate to the printer where he wishes the table to appear by interrupting his copy after any full line with the following instruction:

Insert Table 1 about here

Note the use of rules, which helps make clear that this is an instruction and not copy. Since the printer may not be able to insert the table at precisely the point requested (it might fall at the end of a page), the author should never refer to "the following table" but always cite it by appropriate number, as explained previously.

Tables are expensive to prepare in printed form, so they should be used sparingly and composed with an eye to economy. Avoid repetition of a column in a second table—attempt a condensation into one table instead. Do not use partially filled columns or columns giving the same figure repeated in each cell. Be sure that the material in the table is sufficiently important to justify the expense. In final manuscripts, the cost of table composition is relatively insignificant. Consequently much greater use of this form is typically found.

Illustrative Material

Of the many types of graphic presentation, the most common in scientific literature is the graph or chart. Photographs and drawings or sketches are familiar but not so frequently required. For either final or copy manuscripts these forms demand skills beyond those of writing and typing, which we have been discussing up to this point. Except for photographs, a certain amount of handwork will surely be required. Training in drafting, design, and art is of great help; but a liberal amount of patience, plus study of the tools and rules, is a remarkably good substitute. One or more of the excellent reference guides (1, 2) should be studied.

Planning the Graph. Some scientists hire professionals to construct their charts and graphs, but most of us do our own—sometimes with pretty sloppy results. The first requirement for a good job is good tools. The following list may be considered basic:

1. Drawing board
2. Drafting tape
3. T-square
4. Triangle

5. Drafting pen
6. Lettering pen
7. India ink

These items need not be the most expensive—certainly they need not be of the largest size available—but they should be of good quality. For more elaborate work certain other tools should be added—for example, a drop bow pen (for making small circles), Ben Day materials (for shading and coding different areas), lettering guides, and a French curve or a flexible ruler. An elementary text on drafting should be consulted if the reader is not familiar with the use of these devices.

The graph, like the table, must be planned in consideration of the material to be presented and the space available. In addition, economy is of great importance in copy manuscripts, since reproduction is expensive and journal space is at a premium. Data treated graphically in the typical *curve* (which is not usually a curve at all, but a series of straight lines connecting points) should represent variables which are continuous. When one variable is discrete (i.e., categorical), the bar graph is usually more appropriate. It is customary to plot the dependent variable along the ordinate (vertical scale) and the independent variable along the abscissa (horizontal

scale). The size of units along each scale is to be so determined that nearly all of the scale will be used when the plots are made. This means simply that there should not be extensive blank areas, across or up and down, when the graph is finished.

The original graph should be made at least twice the linear size of the final form (i.e., four times in area), but it must be made in exactly the same proportions. This plan results in a dropping out or minimizing of small defects and is much easier for the novice to produce. Photographic reduction will be made by the printer in the case of copy manuscripts. Regardless of the size of the original drawing, copy sent to the editor should be on sheets of the same size as the rest of the manuscript. If the original is submitted, it should be drawn on fairly heavy poster board. For copy manuscripts or final manuscripts (especially when several copies are to be made) the illustration may be drawn quite large and reduced to $8\frac{1}{2} \times 11$ inches by photostat reproduction. Smaller drawings pasted on typewriter paper are undesirable, since they may become detached and lost. In the case of final manuscripts the positive photostat (i.e., black on white) will take typewriter entries (such as page numbers, titles, or explanatory material) very nicely.

A common mistake in the planning of graphs for final manuscripts is making them either too large or too small. They must not crowd the margins. Remember that scale values and a legend must be placed between the ordinate and the left margin. Scale values, legend, and title must be placed between the abscissa and the lower limit of available space. On the other hand, a tiny graph surrounded by tremendous areas of white looks ridiculous and, even worse, it loses legibility. If standard graph paper is used (sometimes permissible for informal final manuscripts), no markings of any kind should appear in the inch or so of white margin.

With rare exceptions, scale values increase from left to right on the abscissa and up the ordinate. It is not desirable to have the scale read continuously from zero at the intersection when the lowest value to be plotted is considerably greater than zero. A recommended practice is to show zero and then a break (wavy line or a gap between slashes) in the scale shortly beyond the intersection, to indicate omission of values. The abscissa may be drawn with the value next-below-the-lowest-plotted-value placed at the intersection,

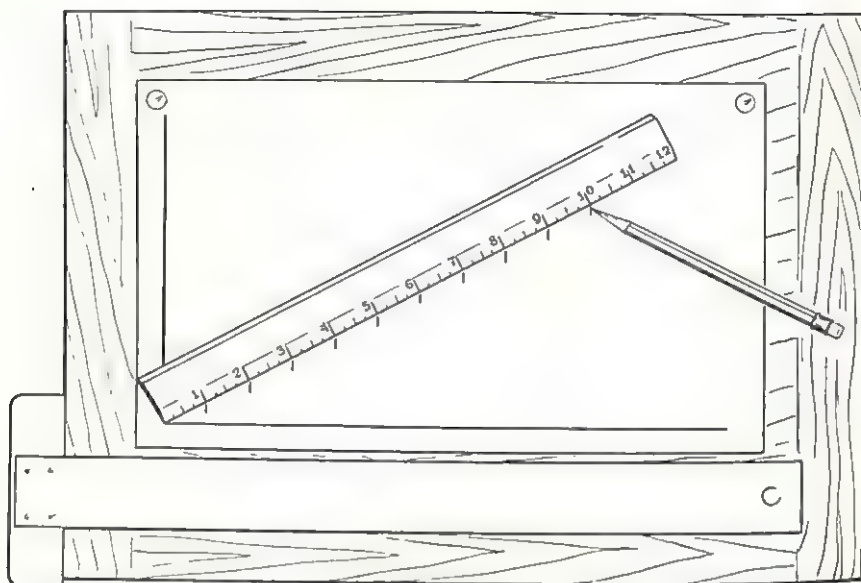
with or without the break. Each scale should continue to a point one interval above the highest value to be plotted.

Unit length on the scale is determined most easily by determining the number of points to be shown on a ruler (inches, centimeters, or other appropriate scale). Be sure that this distance on the ruler is longer than the scale you are drawing. Next, place the ruler at an angle to the scale line with "ruler zero" at "scale point zero" and the largest ruler value needed placed to intersect a line drawn perpendicular to the far end of the scale. Now mark lightly with a sharp pencil all the needed points along the diagonal formed by the ruler edge. With the T-square and triangle, drop perpendicularly down from each of these points to the scale line and mark the points. Figure 8 further clarifies this procedure.

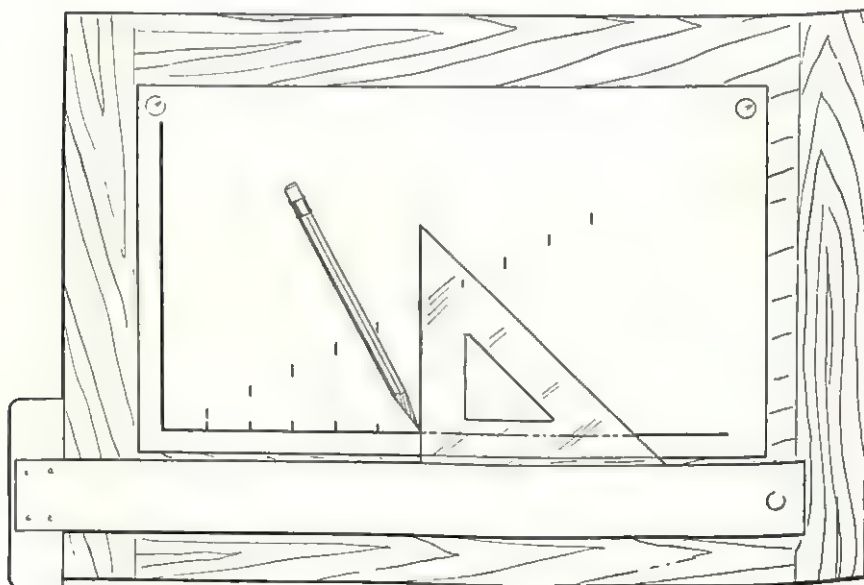
In general the same principles of neatness and maximum legibility, communication, and economy also apply to the bar graph. Spacing between bars and the width of bars should be planned carefully for the most pleasing proportions consistent with the space available. When abscissa categories show subcategories, these appear as adjacent bars without separation (or even overlapping) but distinguished by shading, filling in, or other codification.

Constructing the Graph. Finished graphs are usually made on plain white paper or poster board for reproduction in formal final manuscripts or copy manuscripts. Among the several methods in use, one of the best procedures for determining the scale points and plotted points is to make a well-planned draft on graph paper. This is transferred to the final copy by placing the graph paper over the white sheet and punching with a needle through the original at the major scale points and the plotted points, being careful to prevent slippage during the process. If holes are not too deep or too large, they will be covered up by the inking in of scales and curve. Photographic reproduction directly from graph paper is permissible only if all the printed grid lines are blue, since most photosensitive materials used for this process are insensitive to that color. As a result, the unwanted grids drop out, leaving the inked lines against a white background.

Ordinarily only the curve and the scales are inked in, but major grid lines may be shown throughout the graph if the author prefers. They should be as inconspicuous as possible. The axis lines should



(STEP 1)



(STEP 2)

FIGURE 8. Simple method of dividing the abscissa into any number of equal units.

be fairly heavy with very short and thinner lines extending into (not outside) the graph space, perpendicular to the main line, in the manner of distance markings on a ruler. Show points only to a degree of precision required by the plots. Too much detail is unclear and will not show well on reproduction.

Plotted points are connected with a fairly heavy solid line. Unless smoothing of the curve is required, the "points" amount to no more than places where the curve may change direction. A smoothed curve, drawn against a French curve or a flexible ruler, should show the empirical points as dots unconnected with each other or to the smoothed curve. If more than one curve is to be plotted on the same set of axes, color coding may be used in final manuscripts, but other devices are required if reproduction is necessary. Dotted lines, dashed lines, alternate dots and dashes, and other patterns are in use. In addition, various shapes for the plotted points (filled circles, unfilled circles, triangles, crosses, and so forth) may be used, although this coding method alone is usually unsatisfactory. When two curves are shown and they do not cross each other, they may both be drawn solid, then distinguished by legend.

Scale values on the co-ordinates (axes) are shown by numerals inked in below the small distance markers just described. All these numerals, along the ordinate as well as the abscissa, are positioned in familiar orientation—they are not rotated 90°. Each scale must be identified, the abscissa by lettering centered under the scale and reading horizontally, the ordinate by lettering centered between upper and lower ends and reading up. A legend necessary to identify a curve may be placed at a point near it. If necessary, use simple arrows leading from the legend to the curve. Another method, superior when many curves are drawn on the same set of axes, is to "key" the legends against short, straight replicas of the plots they identify. These are placed in a simple column within the area of the graph and in space not needed for plotting.

Lettering of scale numerals, scale legends, and curve legends may be done by hand with a lettering pen (e.g., "Speedball") if you have had considerable practice. Most psychologists will probably do a neater job with one of the letter guides ("Wrico," "Leroy," "Doric" and other brands are commonly available). A system which gives a very neat appearance is to have all legends, numbers, and so forth set in letterpress type of the appropriate size and printed

on plain white paper. Words and numerals are then cut in individual strips and pasted on the graph in the appropriate position. In the photostating process the edges of the pasted pieces disappear completely. Typewritten legends are, as a rule, not satisfactory if reproduction is to be made. For originals twice the finished size, lettering should be about $\frac{5}{32}$ to $\frac{3}{16}$ of an inch high, and of course proportionately greater if greater than $\frac{1}{2}$ reduction is planned. Some variation in lettering size may be used on a graph, but the larger should exceed the smaller by no more than 50 per cent.

You may have noticed that no reference was made in the preceding paragraph to the title of the figure. In final manuscripts, this is typed on the finished photostat (or original drawing), below the abscissa legend, and centered left to right. In copy manuscripts, the title is typed on a separate sheet. The original drawing (or photostat copy) submitted with the manuscript must have the figure number identified lightly in pencil on the back.

Preparing Photographic Illustrations. If graphic material cannot be shown by a line drawing or a chart of some kind, a photograph may be necessary. This medium should not be used in copy manuscripts unless absolutely unavoidable because of the cost. Not only is reproduction onto a printing plate ("halftone") more expensive than line engravings (which are used for graphs and drawings), but it requires a better grade of paper than is ordinarily used in journals. Hence editors will refuse them unless their importance is clear. For reproduction, photographs should be glossy finish (ferrotyped) and no smaller than 8 x 10 inches. If only a portion of the photo is wanted, do not trim it, but indicate the size desired by short marks in the margins which, if extended across, would frame the picture properly.

There is less objection to the free use of photos in final manuscripts. Ask the photographer to print them on larger stock and then trim to $8\frac{1}{2}$ x 11 inches, with the photo positioned on each page properly and the remainder of the page masked out (i.e., left white). Do not paste in photos, since the result is bulkiness, wrinkling of paper, and possible loss of the photograph. This time you want the photo to have a *matte* (not glossy) finish so that you can type on the title. If it is to be bound along with typewriter paper into a book, it should be on *thin* photo paper.

Photographs for reports of either kind should be of good contrast,

without noticeable graininess, and well composed. Apparatus or other objects to be shown should be placed against a homogeneous background with a brightness value in contrast to the object. Avoid with great care dense shadows falling on important areas and remove all irrelevant objects from camera range. Labels may be made and attached in the scene before photographing or they may be pasted on a large glossy print, which is then rephotographed. The latter method requires less experience. Never send original paste-ups to an editor or include them in a formal final manuscript. Tabs get lost! Unless you are well beyond the "snapshot stage" of amateur photography, you should employ a professional photographer. If he has experience at retouching, he can usually improve the quality of the photo considerably.

Preparing Drawings. Freehand ink sketches by an amateur artist are usually of too poor a quality for scientific reports. Perspective or isometric drawings by a draftsman are to be recommended for most purposes. With a little practice, the amateur can do a surprisingly acceptable line drawing by tracing off the major lines from a photograph of the object. Make the photo on thin paper and place it over a light box with the copy paper over the photo. Trace with pencil and ruler for the straight lines; draw the curved lines by sight. Then use India ink, a ruling pen, and a fine lettering pen (for curved lines) to go over the pencil tracings. Shadings may be added as your skill improves. Dimensions, notations, labels, and the like are easy to put on. The result often tells the story better than the original photo. In regard to lettering, reproduction, titling, and so forth, the drawing should be treated in the same manner as the graph.

ORDER OF PAGES: COPY MANUSCRIPTS

After preparation is complete, pages should be numbered (usually) in the upper right corner, with Arabic numbers exclusively. The following sequence is recommended:

1. Text material. Page one includes the title, author, and location; the text material begins on the same page.
2. The bibliography or reference list. This begins on the next page following the last page of text.
3. Footnotes (if absolutely required). They are typed on the next page following completion of the reference list.

4. Tables. Each is typed on a separate page. All heads and footnotes are typed on the same sheet in proper position. The tables should be placed and numbered at the end of the manuscript.
5. Figure captions. Each is typed on a separate page, which may be put in the proper place within the text. If they are gathered together, there should be an indication of the manuscript page where the figure location is given.
6. Drawings and/or photographs. Each is on a separate page, and these pages are not numbered, but "Fig. 1" and so forth must be pencilled in lightly but clearly in the margin or on the back. Also note here the author and article title, to prevent loss by the printer.

Extreme care should be exercised in packaging the manuscript securely in order to avoid loss or damage in shipment. Manila envelopes should be reinforced at both ends with tape and tied with string. Mailing must be at the first-class rate, not by parcel post or at the book or other reduced rate. Long manuscripts—100 or more pages—may be shipped by Railway Express. Manuscripts should not be bound or stapled prior to shipment. The author should always retain a carbon copy as the best insurance against total loss in shipment. Mail manuscripts of journal articles to the editor, not to a consulting editor or to the publisher.

ORDER OF PAGES: FINAL MANUSCRIPT

Since the nature and purpose of final manuscripts vary widely, no universally applicable pattern can be described. For theses and dissertations, the following sequence is typical, but the student should check practice at his university.

1. Title page. Your graduate school undoubtedly has adopted a required format.
2. Acknowledgment. This should be a brief, factual statement of the participation of others (especially advisors) in the study. It is customary to express appreciation, but it is not desirable to use a "flowery" style.
3. Table of contents.
4. List of tables.
5. List of figures. Items 4 and 5 may be on the same page if the lists are brief.

6. The text. If organized by chapters, give only the chapter number and title at the top of the first page of text; if not, repeat the thesis title here. Begin each chapter on a new page. Insert tables and figures following the first text reference to each.
7. List of references.
8. Appendix.

SUMMARY STATEMENT

In this chapter we have attempted to describe what we believe to be the best practice in the many details of form involved in manuscript preparation, whether for publication or not. Many of our suggestions are made with reference to criteria of clarity, appearance, or economy. However, these objectives offer no solution in many instances. Our arbitrarily determined recommendations in such cases have nevertheless been made with current practice in mind. Consistency is an admirable objective when one cannot assign a better reason, but it is appropriate to remind the reader that when he becomes a writer he is above all a creative producer. Therefore when justification can be made, he should feel free to break the rules. Indeed the discerning reader will have no trouble finding within the pages of this book certain instances of departure from our own recommendations.

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CHAPTER 8

Problems of Publication

The last two chapters have dealt with the writing of scientific reports and the preparation of manuscripts; they are pertinent whether or not the material is to be published. In Chapter 1 we have pointed out the values to the individual of publication of the results of his research and scholarship. That there is also a value to the science is evident. Without dissemination of the results of experiments and theoretical studies science could not advance. And in our current scientific culture, communication of results is in overwhelming measure by means of printed material. Therefore, the psychologist's obligation to share his knowledge with his colleagues requires that he become an author and that he take adequate steps to have his material appear in print.

This emphasis on the value of publication does not mean there should be no restraint. We have already cautioned against hasty and inadequate publication. Such cautions will bear repeating. The psychologist should avoid publication for the simple purpose of seeing his name in print! The first obligation of the author is to evaluate his proposed paper as critically as possible. Unless questions such as the following can be answered affirmatively, an article had best remain in manuscript: Does this paper contribute fact or idea that adds to the present sum of knowledge? Has it been written in the clearest and most concise style? Does it tell the reader for whom intended what the author wants to say? You may rest assured that, if you as author fail to evaluate your paper, an editor will not fail to do so!

With a manuscript completed which will make an acceptable addition to the literature, the question must be asked, "Where should this manuscript be published?" The possible answers are legion;

they may be determined by its content, its length, its level of difficulty, the reasons for which it was written, and, in some cases, the place where, or the auspices under which, the work was done. The next three sections of this chapter are in part designed to help answer this question.

In most general terms, publication will usually be as a journal article, a book, or an independent pamphlet. Each of these presents special problems for the author. In the following sections, each of these three methods of publication is discussed in turn. All methods of publication have some problems in common. The preparation of the manuscript we have already discussed. The author also has the responsibility of checking the accuracy of the conversion of his manuscript into the printed or processed form. This task is commonly called proofreading and is discussed in the final section of the chapter.

JOURNAL PUBLICATION

The young psychologist's first paper, whether it is his doctoral dissertation or whether it has been prepared separate from and earlier than that work, will almost certainly appear in one of the professional journals. The initial task of submitting a paper for publication is very simple. The properly prepared manuscript is sent to the editor of the journal chosen with a courteous request that it be considered for publication. The problems arise in connection with the editor's action on the paper and the author's subsequent responsibility.

Selection of the Proper Journal

It does not seem possible that an author would submit a manuscript on a subject not within the field of interest of the journal selected. Yet the evidence, as shown in a later section, indicates that an appreciable percentage of papers are returned because they do not fit into the journal's editorial policy. Most American journals carry some statement in each issue describing the kind of material they publish. Even if there is no such statement, a few minutes spent in reviewing the articles in one or two issues should make fairly clear what type of paper the editor will accept. We present in the following paragraphs materials describing the editorial con-

tent and certain other information concerning 20 of the major American psychological journals.

American Journal of Psychology (quarterly). This, the first American journal in psychology, "was founded in the interest of experimental psychology and has always been largely devoted to that interest, [but] its pages are open to workers in all fields of scientific psychology." Each issue usually contains materials in each of the five departments: original articles, minor communications, descriptions of apparatus, notes and discussions, and reviews. This journal is unique among the major psychological journals in that it uses footnote bibliographic references. It furnishes 100 reprints free. Authors are charged the full cost of linecuts and halftones, and half the cost of tabular matter and mathematical formulas.

American Psychologist (monthly) is the professional journal of the APA, and a large part of its contents consists of official papers of the Association. It publishes some articles submitted voluntarily or by request. It publishes articles concerning psychology as a profession, methods and resources for professional education, the status of psychologists, and the relation of psychology to other professions. A special section, "Comments," publishes correspondence on issues of current interest. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Educational and Psychological Measurement (quarterly). The following four areas are represented: "1. Discussions of problems in the field of measurement of individual differences. 2. Reports of research on the development and use of tests and measurements in education, industry, and government. 3. Descriptions of testing programs being used for various purposes. 4. Miscellaneous notes pertaining to the measurement field, such as suggestions of new types of items or improved methods of treating test data." Free reprints: 100. Each author is required to furnish a brief biographical sketch, which is published in a separate section, "The Contributors."

Genetic Psychology Monographs (quarterly, two volumes per year). Each monograph is devoted to one long report (occasionally two or three); the subjects of interest are child behavior, animal behavior, and comparative psychology. The author pays a basic charge of \$5.00 per page, plus one-half the cost of tabular matter and the full cost for cuts. Reprints furnished without further charge: 200.

Journal of Abnormal and Social Psychology (quarterly). The material in this journal is approximately equally divided between the areas of abnormal and social psychology, with emphasis on the scientific as distinguished from the clinical. Preference is given to papers in both areas that deal with basic theory and experiment. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Journal of Applied Psychology (bimonthly) has been the standard journal in the applied area for many years. Editorial policy now favors original investigations in applied psychology, except clinical and personal counseling. Papers in the areas of application in industry, education, vocational guidance, engineering psychology, and business are favored. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Journal of Clinical Psychology (quarterly) is "dedicated to the advancement of the clinical method in psychology. Although primarily a scientifically oriented professional journal limited to publication of original research reports and authoritative theoretical articles, it aims to foster the promotion and expansion of clinical psychology as an applied science." Manuscripts should be "as brief as consistent with clarity." Reprints are furnished on order only. Author pays \$20 per page of tables or cuts and \$12.50 per page of text beyond the first \$50 of printing cost.

Journal of Comparative and Physiological Psychology (bimonthly) contains original experimental contributions to physiological and comparative psychology. Experiments utilizing human and sub-human subjects are given equal consideration. Physiological psychology is regarded as including correlational studies of any aspects of behavior and of the neurological and/or biochemical mechanisms underlying behavior. Theoretical interpretations of specific experimental discoveries are encouraged. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Journal of Consulting Psychology (bimonthly) is the clinical journal of the APA. It is devoted primarily to original research relevant to psychological diagnosis, psychotherapy and counseling, personality, and the dynamics of behavior. Case studies, relevant theoretical contributions, descriptions of clinical techniques, and discussions of the training and of the professional practices of

clinical psychologists also appear. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Journal of Educational Psychology (monthly except June to September). The Board of Editors of this journal is appointed by the APA, although the journal is not published by the Association. It "is devoted primarily to the scientific study of problems of learning, teaching, and measurement of the psychological development of the individual. The *Journal* will contain articles on the following subjects: the psychology of school subjects; experimental studies of learning; the development of interests, attitudes, and personality, particularly as related to school adjustment; emotion, motivation, and character; mental development and methods. This last will include tests, statistical techniques, and research techniques in cross-sectional and developmental studies." No free reprints.

Journal of Experimental Psychology (monthly, two volumes annually) publishes articles intended to contribute toward the development of psychology as an experimental science. Experimental work with normal human subjects is favored over work with abnormal or animal subjects. Studies in applied experimental psychology or engineering psychology may be accepted if they have broad implications for experimental psychology or for behavior theory. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Journal of General Psychology (quarterly, two volumes annually). Although this journal is open to matter in any area of psychology, it is "devoted primarily to experimental, theoretical, clinical, and historical psychology." Free reprints: 100. Author pays one-half the cost of tabular matter and the total cost of cuts.

Journal of Genetic Psychology (quarterly, two volumes annually). The full title of this journal is *The Pedagogical Seminary and Journal of Genetic Psychology*, for it is a continuation of the *Pedagogical Seminary* founded in 1891. Its editorial policy emphasizes papers in child behavior, animal behavior, and comparative psychology. Free reprints: 100. Author pays one-half the cost of tabular matter and the total cost of cuts.

Journal of Psychology (quarterly, two volumes annually). The unique feature of this journal is that it provides for immediate publication of material in any area of psychology. The lag in publication is not ordinarily more than three or four weeks. The author

pays for the cost of printing according to a scale of charges published in each issue of the journal. In the April 1953 issue these charges ranged from \$40.00 for four pages to \$320.00 for 40 pages. In addition, the author pays the actual cost for illustrations. Reprints furnished at no additional cost: 200. Each paper is published independently, but they are bound together in quarterly issues, which are sent to subscribers.

Journal of Social Psychology (quarterly, two volumes annually). The special emphasis of this journal is on political, racial, and differential psychology. Free reprints: 100. Author pays one-half the cost of tabular matter and the total cost of cuts.

Psychological Abstracts (monthly) contains non-critical abstracts of the world's literature in psychology and related subjects. Unlike other APA journals, it contains no original articles and therefore solicits no contributions. Competent abstracters are almost always needed, however, especially to cover foreign-language journals, as well as books and periodicals in fields related to psychology. Abstracters are appointed by arrangement with the editor.

Psychological Bulletin (bimonthly) contains critical reviews of the literature in all fields of psychology, methodological articles, and discussions of controversial issues. Reports of original research or original theoretical articles are not accepted. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Psychological Monographs (published at irregular intervals, making an annual volume of about 550 pages) consists of studies of a more definitive nature than are ordinarily possible within the confines of a brief journal article. Preference is given to experimental research, though other studies (such as of apparatus or statistical methods) are not necessarily excluded. Author pays a portion of the cost (about \$4.00 per page) and receives 150 copies of the monograph.

Psychological Review (bimonthly) is devoted to articles in general and theoretical psychology. This area is obviously difficult to define, but preference is given to articles of an integrative nature that contribute broadly to psychological theory. Papers that report experiments, survey areas of psychology, or deal with applications are not appropriate. Contrary to the implication of its name, the *Psychological Review* does not publish book reviews. Free reprints: 50. Author pays one-half the cost of tabular matter and cuts.

Psychometrika (quarterly). Articles concerned with one of the following five areas are considered for publication, although the emphasis is on the first type: (a) the development of quantitative rationale for the solution of psychological problems; (b) general theoretical articles on quantitative methods in the social and biological sciences; (c) new mathematical and statistical techniques for the evaluation of psychological data; (d) aids in the application of statistical techniques; and (e) critiques and reviews of significant studies involving the use of quantitative techniques. All manuscripts submitted to the Editor are evaluated by three or more persons after identifying names have been removed. Reprints furnished free: 200. No charge is made for illustrations or tabular matter.

Editors' Responsibilities

APA Editors' Experience. The number of papers submitted to editors of American journals of psychology is so great and their quality varies so much that the mere submission of a paper for consideration does not guarantee its acceptance. Perhaps the best available description of the situation is to be found in the annual reports of editors of APA journals. These reports are submitted to the Council of Editors but are not usually published. In many of these, data are given concerning the number of manuscripts rejected. In the unpublished annual reports between 1947 and 1951 there were 20 occasions in which the editor gave his rejection rate in numerical terms. The per cent of rejected papers ranged from 28 to 70 with a median at 45. Insofar as these figures may be typical of psychological journals in general it would appear that the chances of a paper's being published are slightly better than 50 per cent. This does not mean that there is an arbitrary exclusion of half the manuscripts received; the real difficulty is that almost half the manuscripts are not acceptable. In 14 of these reports the reasons for rejection are given. The reason most frequently mentioned (in 13 reports) was that the subject matter was not suitable for the journal to which submitted. Next in order were 11 reports giving poor preparation as a reason for rejection. In 8 reports the editor went beyond the immediate content of the manuscripts and rejected them because the material was so minor as to be an insufficient contribution to the literature, and in 5 reports manuscripts were rejected

because of faulty research design or faulty theoretical logic. Finally, 6 reports mention excessive length as a basis for rejection.

Very realistic illustrations of the decisions editors must make are to be found in the editors' reports which are not prepared for publication but for communication with other editors. These reports are highly informal, but by that very fact they give a better immediate impression than would a carefully structured report for publication. Among the reports of the past two years we should like to quote a paragraph from one and a table from a second. It is evident that these quotations are very informal reports obviously not originally designed for publication. The paragraph is from the 1950 report of Laurance F. Shaffer, Editor of the *Journal of Consulting Psychology*:

Among the 93 manuscripts rejected in 1950, 52 were refused publication because they made an insufficient contribution to science or practice—a broad class covering papers that ranged from crackpot “theories,” to tedious summaries of well-known literature, to minor variants of techniques, and to little experiments that had no explicit flaws but that were not of wide interest or importance. Among the remaining rejected papers, 14 had faulty experimental designs, 18 were so poorly organized or written that adequate revision seemed hopeless, and 9 were on topics unsuitable for this Journal. Many of the last group were referred to other periodicals.

Table 12, our second illustration, is quoted from the report for 1949 of J. McVicker Hunt, Editor of the *Journal of Abnormal and Social Psychology*. This was Dr. Hunt's first report, and the table was prepared as an attempt to present to the other editors the kinds of problems he met during his first year. With Dr. Hunt's permission we are reproducing the table exactly as it appeared because it gives information that we have been unable to find elsewhere.

Editor's Action. There is no standard practice followed by editors in making a judgment on submitted manuscripts. In some cases the editor takes full responsibility for acceptance or rejection; in others he may submit the manuscript to a member of a consulting editorial board for decision. In a few instances, manuscripts may be sent to more than one member of a board. In any case, the author may be assured that the editor or one of his colleagues will carefully read the manuscript and express an opinion. It is evident that the mere reading of manuscripts takes time which has to be gained

TABLE 12

Reasons Given in Letters to Authors for Rejecting 147 Articles Submitted to the
Journal of Abnormal and Social Psychology in 1949
 (Quoted from unpublished report of Editor)

<i>Reason</i>	<i>Per Cent</i>
Insufficient contribution but well presented.....	55
Froth or tirades (no data).....	18
Facts with no theoretical import.....	17
Term paper-like reviews with little new.....	16
Case histories probably useless for teaching.....	4
Major defects in design and/or logic.....	52
Over written (much longer than necessary).....	46
Too poorly presented (point unclear).....	49
Outside content emphasis but creditably done and presented.....	48
Quantified social history or description of social groups.....	17
Projective techniques or clinical practice.....	11
Concerning professional problems.....	4
Outside scale (poetry, painting, etc.).....	12
Fair contributions to social, rejected to maintain proportions.....	4
Failure to follow manuscript rules (no paper rejected for this reason alone).....	96

(N.B. The percentages add up to more than 100 because individual articles were rejected for several reasons.)

from the otherwise busy life of the editor. Therefore, an author cannot expect to receive a decision on his manuscript by return mail. Most editors will acknowledge receipt of the manuscript and in some cases may be able to suggest an approximate time within which decision will be made. Seldom can this be less than one month and may at times be eight to ten weeks.

The editor will make one of three decisions. He may accept the paper without conditions of any sort and suggest an approximate date when it will be published. Secondly, he may reject the paper with or without reasons being given. Usually if the paper is rejected the editor will explain why. The third course of action is to recommend or suggest changes in the manuscript in order to make it acceptable for publication. The author is, of course, under no obligations to make the changes, but at the same time the editor is under no obligation to accept the paper unless they are made. Suggested changes may include a recommendation (a) that the manuscript be shortened; (b) that parts be rewritten because as they stand they are not clear; (c) that extensive tabular material should be eliminated or handled in some different fashion; or (d) that

complex text discussion might be simplified by the use of a brief table or a curve. These are only examples of the kinds of suggestions which may be made. In any case, it is wise for any author, and especially one without a great deal of experience, to heed well the editor's advice. He is as anxious to publish important, good material as is the author, but he cannot use valuable pages to include material which, in his judgment, is non-essential. If the editor feels the material is good enough to make suggestions for change, it is very probable that the paper will be improved if his suggestions are followed.

Publication Lag. Upon final acceptance of a manuscript, the editor will schedule the date of the journal issue in which it is to appear. The usual practice is that articles are published in order of their acceptance. There may be minor modifications when a very short paper is scheduled before its turn in order to complete the number of pages for an issue. The time lag between acceptance of a paper and its appearance in print has caused a good deal of concern to both editors and authors. In American journals this lag will average close to 10 or 11 months. Journals vary from one to another, and the same journal varies from year to year. Such variation is evident in Table 13, which shows a short lag of 5 months for one journal in 1949, and long lags of 14 months for one journal in 1950 and for two in 1951. These data are for APA journals only, as reported by the Council of Editors (1). Other American journals would present much the same picture. The problem of lag is serious, and it is of great concern to editors. Fundamentally lag is a result of great increase in research at a time when printing costs impose limitations on the number of pages which can be included in a volume. A part of the lag time is an irreducible minimum necessary in the process of manufacture. The remainder can be reduced only by one or more of the following: shorter papers, higher rejection rates, more pages (which must be paid for), starting new journals (again a costly business), or further experiments with type size and type-page size. At least by the APA, all of these are being considered and acted upon—but two-month lags and high acceptance rates are not around the corner.

The high and increasing costs of printing make it prohibitive to increase the number of pages in each volume of a journal. Therefore, this method of reducing publication lag cannot be used. In

TABLE 13

Publication Lag in Months Reported for APA Journals

<i>Journal</i>	<i>Lag in Months</i>		
	1949	1950	1951
<i>American Psychologist</i>	7	6	6
<i>Journal of Abnormal and Social Psychology</i>	11	11	14
<i>Journal of Applied Psychology</i>	8	10	11
<i>Journal of Comparative and Physiological Psychology</i>	12	14	14
<i>Journal of Consulting Psychology</i>	7	10	9
<i>Journal of Experimental Psychology</i>	12	13	11
<i>Psychological Abstracts</i>	—	—	8*
<i>Psychological Bulletin</i>	5	7	9
<i>Psychological Monographs</i>	15	12	13
<i>Psychological Review</i>	7	8	10

* Because of the methods of securing abstracts a lag figure is difficult to secure. The estimate for 1951 is based upon a special study and represents the time between receipt of a book or journal in the editorial office and the month publication date of the journal issue in which the abstract appeared.

fairness to all authors, the editor cannot make an exception and modify the order of appearance of a paper. However, it has become official policy of the APA journals, and the practice is followed by some other journals, that a paper can be published out of turn if the cost is met from some source other than the journal's regular budget. This means that if the author or agency under whose auspices the research has been done is willing to finance the cost of additional pages, a manuscript will be published out of turn and as promptly as the periodicity of the journal allows. There has been considerable discussion on the fairness and ethics of this policy, but it seems fruitless to recall them here since the question has been settled. If an author desires prompt publication, he should inquire of the editor concerning whether this is a policy of the particular journal and, if so, an estimate of the cost. Such an inquiry can be made when the manuscript is first submitted, but no editor will allow his decision for acceptance or rejection to be influenced by the fact that the author is willing to pay the costs of publication.

Costs of Publication. In the preceding paragraph we have called attention to the possibility of the author's paying the costs to secure prompt publication. The amount of such costs will vary with different journals. In some cases only an estimate can be given, and the author is charged the actual amount of the printing bill. In other cases a standard price per page has been established, and

the author is required to pay it. Because such figures on costs vary considerably with journals and over a period of time, it would be misleading to quote them here.

Many journals now require that the author pay a portion of the extra cost necessitated by elaborate tables, mathematical composition, and illustrations. Such costs are charged even though the paper will not be published before its turn. Here again the amounts charged vary, but the author will be informed by the editor when the paper is accepted.

Author's Responsibilities

The preparation of a good manuscript is the author's first responsibility; its mechanical preparation we discussed in Chapter 7 and the form of its content in Chapter 6, but the substance of the content must be left to the author's scientific ability and integrity. Mention should be made of the necessity of having permission to reprint material from other publications; this will be discussed in connection with books later in this chapter. The completion of an adequate manuscript and its submission to an editor, however, does not mean that the author has no further responsibility in its publication.

When the editor has arranged the papers that will make up each issue of the journal, this material is prepared by markings and directions to the printer and the process of manufacture starts. The material is set into type and proof printings are made. The type is arranged on a frame, usually about three pages long, known as a galley, and the first proofs are printed from these galleys.

Proofreading. Copies of the galley proofs are sent to the journal editor and to the author. The author usually receives two sets of galley proofs, one of which has an indication that corrections should be made on it and the whole proof returned to the editor. Methods of reading proof are the subject of the last section of this chapter. If production and, therefore, publication schedules are to be kept, it is imperative that the author read the proofs as promptly as possible. For the ordinary journal article the proof should be corrected and sent to the editor within 48 hours of its receipt. The editor will have read the proof received by him and will add to it any corrections reported by the author. The fully marked galley proofs will be returned to the printer for correction.

After correcting the type from the galleys, the printer arranges the type by pages as it will appear in the journal. Page proofs are usually sent to the editor so that he may check to see that all corrections on the galleys have been made—and that no further typographical errors have occurred. Page proofs are not ordinarily sent to the author. It is for this reason that the author should read the galley proofs with great care.

Reprint Orders. Usually an order blank, giving the cost of reprints, is sent with the galley proofs. Unless this order is completed and sent to the editor with the corrected galley proofs, there is no guarantee that reprints will be later available. In the usual practice the printer schedules his work so that the issue of the journal is completely printed; he then separates the pages of type for a given article and fits the separate printing of reprints into his production schedule. Whereas it may be possible to arrange for reprints after the galley proofs have been returned but before the issue is printed, it is usually impossible to do so afterward. So that many pounds of type material are not tied up, the printer remelts the type shortly after he has completed the issue and the orders he has for reprints. Once this is done, reprints would have to be reset, and this would be prohibitively expensive.

Most American journals furnish the author with a limited number of reprints without charge. Additional copies may be purchased. Prices given for reprints are usually on the basis of a certain amount for the first 50 or 100, and a second price for additional lots of a similar size. The cost of the first lot is usually appreciably higher than the cost for additional ones. How many reprints an author should order is a question with a wide range of answers. The minimum number is certainly 50, and where reprints must be purchased, no order should be for fewer than the smallest initial lot, i.e., 50 or 100. The number of reprints to be secured is determined in part by how widely the author wants to distribute them. Frequently authors send reprints, especially of research and theoretical papers, to other psychologists who are known to be interested in that field. This is done whether or not the author knows the recipient personally. Whatever the amount of original distribution, it is well to save several dozen reprints to fill requests, some of which are frequently received many years after the paper was originally published.

BOOK PUBLICATION

It is not usual that the young psychologist's first work is of a size to warrant publication in the form of a book. However, for many psychologists, at some time or other, books become the most logical publication medium. We shall eliminate from consideration what are known as trade books, that is, those intended to be sold for general reading by the lay public and usually marketed through the general bookstore. If an author has a manuscript of this type, there is much to be gained by putting it in the hands of a literary agent rather than attempting to find a publisher directly.

Professional books may be divided conveniently into technical or monographic works and textbooks. The former designation is intended to include the reports of an extensive research program or an extensive systematic treatment, theoretical or otherwise, of a relatively limited field. Textbooks are works which discuss varied aspects of fairly broad fields at an elementary or advanced level.

Book publication involves an investment on the part of a publisher of considerable sums. Therefore, publishers are apt to examine manuscripts submitted to them in terms of their possible sale before any other criterion is used. Publishers are interested in manuscripts which promise to be widely used, but most of the major publishing houses accept manuscripts which will have a limited sale but will add scholarly prestige to their offerings. An author must remember that, although his manuscript appears important to him, the publisher must consider many other factors before he agrees to accept and publish it.

The Problem of a Publisher

Publishers are always interested in finding book-length manuscripts, especially of textbooks, that promise to have a commercial as well as a scholarly value. The major publishing houses have representatives who visit college and university campuses one or more times each year. Although the primary function of these representatives is to establish and maintain good will toward the books of his company, they are also an interested and convenient first contact for an author. Seldom do these men have authority to do more than enter into the most preliminary discussions; they will,

however, report on manuscripts completed or in preparation, usually with their recommendation and evaluation of the manuscript and its author. The author can, of course, make direct contact with the official of the publishing company who is in charge of its college list, or with the editor of a series.

It is not necessary that a manuscript be completed before contacts are made with a publisher. In conversation with the representative, or correspondence with the home office, the nature of the work under way—an outline of its proposed content, its purpose, the level of difficulty, and so on—may be described. Often this preliminary kind of information is sufficient to make the publisher express interest. However, in the case of new authors especially, the publisher usually will not make a final commitment until the manuscript is complete, or a sufficient amount is written so that an adequate evaluation can be made.

Readers and Editors. The publisher does not depend only on a canny knowledge of the market, the requirements of college instructors, and classroom needs. Usually the manuscript will be submitted anonymously to one or more readers for professional evaluation of the content. Such readers are persons known to have worked in the area covered by the book either as teachers or research workers. Usually the author's identity is not revealed to the reader, nor is the reader's identity known to the author. A number of publishers have established series of books under the editorial control of an authority in the professional field concerned. Well-known examples of such series are Prentice-Hall's Psychology Series, edited by Paul Meehl, Kenneth Spence, A. T. Jersild, and C. L. Shartle; Van Nostrand's "Textbooks on Psychology," edited by J. P. Guilford; Appleton-Century-Croft's "Century Psychology Series," long under the supervision of Richard M. Elliott; and Harper's series under the editorship of Gardner Murphy. The editor of such a series has major, if not complete, authority in the acceptance of books for publication in it.

Although evaluation of a manuscript being considered for publication is perhaps the major responsibility of the series editors and the publisher's readers, they may, and frequently do, go further. These evaluators, like journal editors, may recommend acceptance or rejection, or make suggestions for reorganization or rewriting to make the book more acceptable. The author is in no way obligated

to follow the suggestions. But if he does not, and cannot present cogent reasons for not doing so, he cannot expect his manuscript to be accepted. It is the wise course to consider every suggestion very carefully; in the long run many or all of them will result in a more acceptable book. Remember, the publisher's reader is reacting to the manuscript in the same way—if perhaps more critically—that the purchaser of the completed volume will react.

Agreements with Publisher. Once the publisher has decided to accept a manuscript—sometimes before it is finished or even started—the relations between the author and the publisher are governed by a legal contract. In the usual low-Flesch-Index legal language both parties agree to share responsibilities in the publication of the book. The arrangement and wording of the contracts of different companies vary, but items included are fairly standard. The author usually agrees to give the publisher certain rights to his book, to furnish a manuscript in a form satisfactory to the publisher, to prepare an index, to guarantee that the work has not previously been published, to secure permission to include copyright material, to prepare a revision if requested by the publisher, to pay for proof alterations in excess of a certain percentage of the composition costs, and not to publish any future book which would duplicate, or commercially conflict with, the one under contract.

The publisher usually agrees to print, bind, advertise, and market the completed book; to render accounts of sales and pay royalties at stated times to the author; to share with the author all non-sale income such as that from translations, abridgments, and dramatic or similar rights; to furnish the author with a stated number of free copies of the book and to sell additional copies to him at a wholesale price; and to keep the book in print as long as, in their judgment, it is marketable and, when it is not, to give the author an opportunity to buy the remaining copies and the plates at a stated price.

Provisions such as those listed appear in publishing contracts we have examined. Such provisions govern the relationships in a legal sense, but in actual operations relations are less formal. The author may be consulted regarding the format of the book, and the publisher's copy-editor may spend many hours of work on the manuscript. Some publishers will prepare excellent drawings for illustrations from rather rough sketches furnished by the author. The author may

be asked to suggest advertising possibilities or journals to which review copies should be sent. Although publishing houses are bound by the same laws of supply and demand as are banks or grocery stores, they are dealing in scholarship and this is evident in their relation with their authors.

Royalties. In return for the release of his proprietary rights in a manuscript, the author is paid royalties. In common practice the royalty is 10 per cent on the first 2,000 or 2,500 books sold, with an increase on further sales to a maximum of 15 per cent. In addition, a percentage of income on sales in foreign markets or of unbound sheets is paid. Income from sources other than book sales, such as sale of rights of translation or abridgment, payments for permission to reprint major amounts of material, and income from dramatic or other entertainment rights, is usually divided equally between the publisher and the author. Royalty statements are generally submitted to the author semi-annually and the amount is paid when the statement is sent or at a definite time thereafter.

Author's Responsibilities

In the preceding section we have mentioned several things which the contract with the publisher requires of the author. One of these is the furnishing of a satisfactory manuscript, which has been dealt with at considerable length in Chapter 7. Others are concerned with the clearance for reprinting copyright material, the reading of proof, and the preparation of an index.

Copyright and Permissions. Under United States law, material may be copyrighted for an original period of 28 years and, within one year before the expiration of this term, the copyright may be renewed for a period of the same length. Thus a book or other material is protected for a period of 56 years and not longer. In Great Britain the copyright period is for the life of the author and 50 years thereafter. American law requires that a notice of copyright be printed in each book or issue of a journal. British law does not have this requirement. The copyright entry is usually placed on the reverse of the title page in books and on the "masthead" page of a journal. Professional journals are frequently not copyrighted; this can be assumed to be the case if no entry is to be found.

Questions about reprinting copyrighted material are frequently asked. In strict interpretation the reproduction of even one sentence

is a violation of the copyright. And the fact that the reproduced material is to appear in a form that is not to be sold is entirely immaterial. There is no single rule concerning the amount of material which may be reproduced without permission but with credit given. The commonly held view is that it should not exceed 50 words from a textbook or other technical treatise which is copyrighted (3). There are several exceptions to this unofficial rule, the most pertinent of which are that permission is needed for a quotation of less than 50 words if it is 5 per cent or more of the whole, if it is to be used in an anthology or compilation, if it is from an unpublished work of any kind, or if it is poetry. Government publications, which are not copyrighted, may be quoted more liberally. In this latter case it must be remembered that the government is allowed to reproduce copyrighted material with credit. Therefore the author wishing to reproduce from a government publication must be sure that the passage is not protected under a privately held copyright.

Quite apart from the legal question involved in copyright violation, the use of another author's material directly or thinly paraphrased is plagiarism. This is a serious violation of accepted professional ethics and will inevitably redound to the discredit of the author. Common practice and courtesy to colleagues require that permission be asked of the author for reproduction of his material. The securing of such permission is the responsibility of the author.

Requests for permission to reproduce copyrighted material should be addressed to the owner of the copyright as shown by the entry in the book or journal. In the case of books such requests may be addressed to the publisher—who is usually the copyright holder—and he will secure or advise about any other permission required. For uncopyrighted material, and as a courtesy if the copyright is owned by someone else, a request should be made of the author for permission to use his material. These letters of request should indicate very clearly just what the passage or material is which is to be reproduced. The nature of the work in which it is to be used should also be given.

Permission for small amounts of material will usually be granted. For some material—e.g., extensive passages several pages in length, pictures which are themselves copyrighted, or excerpts from the

works of certain authors—permission is granted only on payment of a fee. In such cases the author must decide whether the material is of sufficient importance to warrant the payment. If so, the payment is made by the author or the publisher according to an agreement between them. Credit and acknowledgment of the permission should always be indicated. Some publishers will require a standard form of acknowledgment to be followed. All letters granting permission should be carefully preserved either by the author or the publisher.

Proofreading. As with journal articles, the author is responsible for reading proofs of his book. The procedures, to be discussed in the last section of the chapter, are the same as they are for journal articles, but the author of a book is also responsible for reading the page proofs. Both proofs should be read with care. It must be kept in mind that changes from the original manuscript made on galley proofs mean expensive charges in composition. Such changes made on the page proofs are even more expensive. The addition of a three- or four-word phrase in galley proof may require the resetting of a whole paragraph; such a change in page proof may result in remaking two or more pages. Type metal is neither compressible nor expandable; material cannot be added without resetting one of more lines. Avoid any changes in proof that add to, or subtract from, the manuscript copy as submitted.

Indexing. Professional books are used not only for connected reading but also for reference purposes. For this second function an index is essential. Because the author knows his text better than anyone else, he is the logical person to compile the index. Unfortunately for many authors, this is a chore they would gladly avoid. However, unless the author can secure the services of an intelligent and skilled indexing specialist, he had better resign himself to the fact that if his book is to serve most usefully, he will have to furnish an adequate index.

Many technical books contain two indexes, one of personal names and one for subjects. Bingham (2) argues strongly and amusingly for having only one index which includes both personal names and subjects. We do not feel that this question can be arbitrarily decided. We are inclined to agree with Bingham, although under special circumstances separate name and subject indexes may be advisable.

The preparation of an index is relatively simple if it is carefully

planned and systematic procedures are followed. In usual practice, the index is made from one set of page proofs. Bingham quotes John Askling, a specialist on indexing, who proposes that an important start can be made if the author marks on the galley proofs items to be indexed. His suggestion is that one set of galleys be read, insofar as possible, as if one were not the author. On the proofs each concept which it is felt should appear in the index is underlined and an indication made in the margin. This suggested use of galley proof provides more time for working on an index, but at the same time it requires additional work because the markings must be transferred to the page proofs. The procedures we describe assume that indexing is done from the page proofs.

Before actual work is started, it is well that a set of principles be established. How detailed is it felt the index need be? Will it be limited to major topics, such as personal and other proper names, methods, major discussions of concepts, and the like; or is an effort to be made to include even incidental mention of any of these?

The actual work on the index should be done on standard 3 x 5 inch cards. Starting with the first paragraph of the text, the book should be read paragraph by paragraph, and a card made for each entry. The card should, of course, include the page number where the reference occurs. The entries should usually have two, and frequently three, degrees of subdivision. More than this is undesirable because it makes the index complex. It is convenient in writing the card to put the major entry on the first line, a secondary entry on a second line preceded by a period or a short dash, and a third subdivision on a third line preceded by two dashes or two periods.

When cards have been made for all entries in the total manuscript, they should be alphabetized, and the entries typed double-spaced on 8½ x 11 inch paper. The typing should be only one column to the sheet and in the form in which it is to be printed. The following example taken from Stevens (4) illustrates the style:

Cortex, auditory, 1121
cerebral, 121, 125f, 130, 136
mass action, 777-779
suppressor bands, 174
optic, response of, 968-969
precentral, equivalence, 768
projection of body surface on, 138
somatosensory, 126, 128f, 144f

The formulation of entries should be such that the user finds the index most convenient. Chapter headings or major section headings need not be indexed because they have appeared in the table of contents. Isolated, detailed, definite topics should generally be chosen. Cross-references should be used where they may help the user. In the example just given, the major entry is "Cortex" with "cerebral" appearing in the second alphabet. However, the term "cerebral cortex" is one that a user might look for. Therefore, there should be an entry in the first alphabet, "Cerebral cortex, *see* Cortex." In general, the index should be simple and clear; always it is designed to facilitate use of the book for purposes other than connected reading.

The typewritten copy should be carefully proofread against the rough index cards, and careful attention should be paid that all entries are in their proper alphabetical order. When this copy is satisfactory, it should be sent to the publisher as promptly as possible. Although all the type may be set and the pages made up, the book cannot be completed until the index has been set in type and is itself proofread.

INDEPENDENT PUBLICATION

We are limiting "independent publication" to the reproduction of a manuscript by the author at his personal direction and expense in an appreciable number and with the intention of making the work generally available. Duplication of a report by typewritten carbon copies or mimeographing of a dozen copies for private circulation within an organization or to a few friends is not included. Neither is publication at the author's expense in regular trade channels. There are circumstances, in which special functions may be served, that may justify independent publication. In general we most strongly advise against it. One reason for such advice is that independently published material is immediately suspect, even though it may be of great value. Secondly, unless the author makes a special effort, such publications do not become a part of the recorded literature and are easily overlooked and lost. However, recognizing that independent publications may meet a particular need, we make some suggestions which may be helpful.

Privately Printed Book

Book publishing and book printing are distinct activities which are frequently confused. The publisher evaluates a manuscript, prepares it for printing, designs the book, has it printed and bound, advertises and sells it, and in general fosters his own and the author's interest in the property. The author who feels he must or wants to publish his book privately must be ready to assume all of the publisher's functions if he hopes to have his book get the attention he is sure it deserves.

Printing. The selection of a printer is important. A local job printer may do excellent work on letterheads or advertising circulars but be completely unable to produce an adequate eight-page pamphlet. A larger plant may print handsome pamphlets but not be equipped to print, fold, gather, and bind the dozen or more signatures found in a book of 200 or so pages. If time is spent in discussing the problem with printers, it is always possible to find a firm capable of doing the job. It must be remembered that the printer will reproduce the copy given him. He will do none of the copy-editing done in the publisher's office; therefore it is extremely important that the copy be as perfect as possible. The author is paying the bills and therefore he will have to meet all of the expense for corrections in proof, except, of course, errors made by the compositor in not following copy. Decisions on type to be used, type-page size, kind of paper, binding, and so on must all be made by the author, or be entrusted pretty largely to the printer. None of these tasks is impossible, but they will demand time of the author.

Distribution. Except in the case of some firms which specialize in "vanity" publishing, the printer's responsibilities cease when he delivers, or makes available in his warehouse, bound copies of the book. The author must arrange for advertising, review copies, sales, distribution, collections, and all the other factors involved in ensuring that the book reaches the final reader. If the author can afford it—after paying the printing bills—he may send all copies to friends, to persons known to be interested in the field covered, to college, university, and major public libraries, and to a few journals in which it may be reviewed. This expensive method solves the problem of distribution most easily.

The more usual methods of distribution require advertising and

the business of sales, shipping, keeping records, and so on. As we have advised against independent publication, it would be inconsistent to describe in detail how to market the book. For the sake of the recorder of literature, not for that of the author, we plead that certain things be done. Enter copies of the book for copyright—this will protect the author's rights and also ensure that there will be at least one copy in the Library of Congress. Be sure the title page has an imprint—this may be the author's name and address, but it should have some indication of where the book is obtainable. Be sure that copies are sent to the H. W. Wilson Co. for inclusion in the *Cumulative Book Index* (A 1), to *Psychological Abstracts*, and to other abstract journals which might be pertinent; these reference works will put the book in the usual bibliographical records. For critical notices copies should be sent to technical journals which publish book reviews. Beyond these types of professional distribution we will leave to the author's ingenuity ways of making his book known and of stimulating its sale.

Processed Publications

The term "processed" refers to publications printed by means other than letterpress, i.e., ordinary metal type. Mimeographs, liquid duplicators (Ditto machines), and offset printing are the most common methods subsumed under the term.

Mimeographing requires the cutting of stencils on specially prepared sheets by means of typewriting or with a stylus by hand drawing or lettering. The final copies are made on a drum machine inked with a special ink. By the use of paper of good quality, cleanly cut stencils, careful inking, and skillful machine operation, sheets of good appearance can be produced. Sheets of 8½ x 11 inch size are standard and these can be stapled and covered with a heavier cover stock to produce a very adequate book.

Liquid duplicators—commonly called Ditto machines from the trade name of the most used machine—require typing on specially prepared mats (or stencils) with a special ribbon or carbon paper. The usual ink is purple and final sheets are apt not to present as clean-cut an appearance as with the other process methods. This method is used frequently for short reports but is not common for long books.

Offset printing is becoming a very frequently used method of

printing. It depends upon the photographic reproduction of copy and therefore reproduces typewriting, letterpress, drawings, or photographs well. Typing for offset copy should be done, for best results, on special white paper with an extra-black ribbon. Offset printing is often done on $8\frac{1}{2} \times 11$ inch sheets, although presses are now available which print several pages at a time; the sheets are folded into signatures as in letterpress printing. Firms such as Edwards Bros., of Ann Arbor, Michigan, or W. C. Brown, of Dubuque, Iowa, are able to handle large books and have become publishers as well as offset printers.

The first two of these methods have the advantage that they can be done in a departmental office or by the institutional or local commercial duplicating service; offset printing must be done in a specially equipped plant. All three are being increasingly used for the reproduction of important literature. However, their use means that the author must accept additional responsibilities if his work is not to be lost.

Copy Preparation. Copy for processed material in its final form of stencil or mat corresponds to the block of type for the page of the letterpress book. It must be proofread with care and corrections made or the page retyped. The format of the manuscript will follow the pattern of what we have called "final manuscripts" in Chapter 7. It is probably worth every bit of the extra cost to have only the most competent typist prepare the stencil, or to entrust this task to the duplicating service which will do the printing.

Format. Most processed material will have a page size of the common letter sheet, i.e., $8\frac{1}{2} \times 11$ inches. In the case of short documents this makes filing simple, and in the case of book-length manuscripts the product can be stacked on shelves without serious trouble. The larger, legal-size sheet is sometimes used, but the saving in number of sheets is far outweighed by the difficulties of filing or stacking. All processed documents should have certain bibliographic data clearly indicated. If possible there should be a title page (in short booklets the cover may serve as a title page) containing the title, author's name and identification, year date, and an imprint giving the name and address of the publisher or source from which copies may be secured. Very short documents may contain this information in the title-and-author heading and a first-page footnote. A cover is highly desirable, as it provides a most convenient way of

Size and Style of Type

- wf* Wrong font (size or style of type)
lc Lower case letter
LC Set in **LOWER CASE** or **LOWER CASE**
cc capital letter
caps SET IN **capitals**
cap & lc Lower Case with Initial Capitals *cap & lc*
sm caps SET IN small capitals
caps & s.c. SMALL CAPITALS WITH INITIAL CAPITALS
nom. Set in *roman* type
ital Set in *italic* type
ital s.c. ITALIC SMALL CAPITALS
ital caps ITALIC CAPITALS
L.F. Set in **lightface** type
bf Set in **boldface** type
bf ital **Boldface italic**
bf caps **BOLDFACE CAPITALS**
sup Superior letter or figure^a
sub Inferior letter or figure^a

Position

- Move to right —
 □ Move to left
center □ Put in center of line or page □ (*ctr*)
 □ Lower (letters or words)
 □ Elevate (letters or words)
 □ Straighten line (horizontally)
 □ Align type (vertically)
 □ Transpose space
 □ Transpose enclosed in ring (matter)
 □ Transpose (order [letters of] or words)
 □ Rearrange words of order numbers in
 □ Run over to next line. (A two-letter division should be avoided)
 □ Run back to preceding line. (Such a division is improper)
 □ A syllable or short word standing alone on a line is called a "widow"; it should be eliminated.
 □ The nearly blank line is called a "quad line"

Spacing

- solid* Means "not leaded"
leaded Additional space between lines
blm Insert lead between lines
blld Take out lead
 () Close up entirely; take out space
 () Close up partly; leave some space
vor Less space between words
in or of Equalize space between words
line # Half space between letters
thin # Thin space where indicated
1/4 LETTER-SPACE
 # Insert space (or more space)
space More space between words
2 pts # Insert space (amount specified)
cs 1 pt Take out space (amount specified)
em quad 1/2-em quad (nut) space or indentation
 □ Em quad (mutton) space or indentation
 □ Insert number of em quads shown

Insertion and Deletion

- OUT* Insert matter omitted; refer to copy
we copy (Mark copy Out, see proof, galley 00)
the Caret. Insert marginal addition
Q or Q Dele. Take out (delete)
Q Delete and close up
Q Correct letter or word marked
stat Let it stand—(all ~~matter~~ above dots)

Paragraphing

- Q* Begin a paragraph
no Q No paragraph.
Run in Run in or run on
Q Indent the number of em quads shown
Flush No indentation *FL* Flush left
Hanging Hanging indentation. This style should have all lines after the first marked for the desired indentation, either separately or by means of a bracket, as shown

Punctuation

- Q* Insert period or "full point"
Q or / Insert comma
Q or : Insert colon
/ Insert semicolon
Q or ' / Apostrophe or 'single quote'
Q or " Insert quotation marks
Q Insert question mark or "query"
Q Insert exclamation point or "bang!"
/ or - Insert hyphen
En dash
One-em dash
Two-em dash
Q Insert parentheses (curves; "fingernails")
Q Insert brackets (crotchets)

Miscellaneous

- Q or X* Replace broken or imperfect type
Q Reverse (upside down type or cut)
Q or L Push down a space that prints
Q Spell out (twenty)
- Q* Question of grammar
Q Question of fact
Q or Q Query to author
Q or Q Query to editor
Q Mark-off or break; start new line

Diacritic Marks; Signs; Symbols

- Q* Diaeresis or umlaut
Q Accent acute
Q Accent grave
Q Circumflex accent or "doghouse"
Q Cedilla or French c
Q Tilde (Spanish); til (Portuguese)
Q Use ligature (affix—fit)
Q Sign of equality
/ Virgule (separatrix; solidus; stop mark)
Q Asterism * * * Leaders.....
Q Ellipsis . . . or * * * or —
 Order of symbols: * † § ¶ #; then double

"ROUNDUP OF EDITORS' AND PROOFREADERS' MARKS," BY JOHN EVANS.
 COPYRIGHT, 1952, BY JOHN EVANS, USED BY PERMISSION.

FIGURE 9. Editors' and proofreaders' marks.

binding. Such items should never be stapled in only the upper left-hand corner; two or three staples parallel to the left-hand edge should be used.

Distribution. Processed material may be copyrighted in the same manner as printed books, and this should be done. Copies should be sent to the regular bibliographic references. In addition, copies of documents of less than book length should be sent to the H. W. Wilson Co. for inclusion in their Vertical File Service (A 9). Beyond this, distribution depends upon the author, to whom suggestions made earlier in connection with privately printed books may be helpful.

PROOFREADING

It is the ideal of every author and bookmaker that the final product be letter-perfect. This ideal is reached only occasionally, but is usually closely approached. Whatever perfection is obtained is brought by careful attention to details and by competent workmanship. Proofreading typewritten material presents the same problems as proofreading letterpress printing, but our concern is with the latter. To reach the printed page, the words written by the author must be set into type by hand or machine, the blocks of type must be held in galleys and galley proofs printed, and the blocks must be made into pages and locked into forms for the press, where, after inking, the printed impression is made on paper. Errors may creep in at almost any stage, although those occurring in the original composition are most important.

The usual Linotype or Monotype Machine compositor is an intelligent workman, but he can hardly be expected to operate the keyboard and at the same time to read the copy with understanding and to note the author's errors. The same compositor in the course of a month or a year may work on your book in psychology, a mathematical text, a German reader, and works in literature, biology, engineering, French, or Spanish. One man could not understand the manuscript of each of these equally well. The expert workman "follows copy" exactly, no matter what the content, and lets the author's errors fall where they may. Of course he may make a few also.

After type is set, a proof is printed from the galley. This is read by the professional proofreader in the printer's plant. Again no attempt is made to understand the content, but merely to ensure that the copy has been exactly followed. However, the proofreader may catch what he believes are errors in copy. These he will not change

sm. caps It does not appear that the earliest printers had any method of *e/*
cf. # correcting errors before the form was on the press. The learned ~~The~~ *o/2*
2 learned correctors of the first two centuries of printing were not
#/1 proofreaders in our sense; they were rather what we should term *3/3*
not/ office editors. Their labors were chiefly to see that the proof corre- *1/1*
 sponded to the copy, but that the printed page was correct in its
1/1 latinity ~~that the words were there~~, and that the sense was right. *stat*
2 They cared but little about orthography, bad letters or purely printer's *2/3/1*
 errors, and when the text seemed to them wrong they consulted fresh
 authorities or altered it on their own responsibility. Good proofs in *2/*
not # the modern sense, were impossible until professional readers were *x*
etc employed men who had first a printer's education, and then spent *tr*
1/ many years in the correction of proof. The orthography of English,
 which for the past century has undergone little change, was very
fl. fluctuating until after the publication of Johnson's Dictionary, and
 capitals, which have been used with considerable regularity for the
(SP) past 80 years, were previously used on the miss or hit plan. *2* *ld*
 approach to regularity, so far as we have may be attributed to the *it/*
 growth of a class of professional proof readers, and it is to them that
 we owe the correctness of modern printing. More errors have been *2*
 found in the Bible than in any other one work. For many generations
 it was frequently the case that Bibles were brought out stealthily, *ld in*
 from fear of governmental interference. They were frequently printed *out, see copy*
 [from imperfect texts, and were often modified to meet the views of
h/ those who published them. The story is related that a certain woman ☐
2 in Germany, ~~who was~~ the wife of a printer, ~~and~~ had become disgusted *c.e./who*
3/1/1 with the continual assertions of the superiority of man over woman *rom.*
 which she had heard, hurried into the composing room while her
 husband was at supper and altered a sentence in the Bible, which he *ref.*
2 was printing, so that it read Narr instead of Herr, thus making the *2*
 verse read "And he shall be thy fool" instead of "And he shall be thy *2*
2 lord." The word not was omitted by Barker, the king's printer in *2*
 England in 1632, in printing the seventh commandment. He was fined *2*
Am: 4? £3000 on this account.

FIGURE 10. Part of a proofread galley proof. Normally, of course, no proof
 has so many errors. In fact, if the manuscript has been well prepared, a good
 printer can set many galleys of type without making any errors at all.

but will call to the author's attention with a query on the proof. Sometimes corrections are made in the galleys after their first proof-reading by the printer. Either the first proofs or corrected proofs are sent to the author.

Every author has an obligation to read the proofs with care. If he cannot or will not do so, he should employ careful readers to perform the task for him. In any case he alone is responsible for the corrections made on the proofs. Each correction made means that the block of type must be examined and the incorrect type replaced with that which is correct. A single-letter change is relatively simple; a word changed to one of the same length is not too difficult. But, as an example, changing the word "mind" to "consciousness" means that four characters must be replaced by thirteen. The result is that several lines will have to be reset in order to make space for the new word. This has been mentioned before. It is repeated here to emphasize that typographic errors only should be corrected; do *not* rewrite. Matters of style and methods of expression should have been taken care of in the original manuscript.

The method of marking proof for correction has become standardized. Universally used symbols are shown in Figure 9 with their meanings; a corrected proof is given in Figure 10. These symbols are few in number and easily learned. Never correct proof without knowing the symbols or having a sheet such as Figure 9 at hand. All corrections should be made in the margin of the proof; handwriting must be legible; if there is a sentence or more which must be added, it should be typewritten and attached to the proof with a clear indication of where it is to be inserted. Special directions to the printer may be written in the margin and encircled by a continuous line to indicate that they are not to be printed. Use of standard symbols and clearly indicated directions for change will facilitate making corrections in the type galleys.

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CHAPTER 9

Minor Forms of Scientific Reporting

Although the major reporting activities of psychologists are in the form of journal articles, monographs, and books, they are not limited to these forms. Chapter 6 was devoted to problems of writing and publishing major types of articles; in this chapter we shall discuss a number of secondary, but nonetheless important, forms of scientific communication. These include the thesis and dissertation, abstracts, book reviews, criticism, films, oral reporting, some types of reports with limited distribution, and writing for the public. The function of communication is one thing these types of reports have in common; their form, method, and specific purpose all differ. Therefore, it is most convenient to treat each of them in a relatively independent section of this chapter.

THE THESIS AND THE DISSERTATION

The term *thesis*, in American universities, has come to refer primarily to the product of some special concentrated study by the student during his period of work for the degree Master of Arts, or its equivalent. A committee of the American Association of Universities has formulated the following excellent statement of the nature of the master's thesis:

It is reasonable to expect that, in a fifth year of academic work of respectable quality, a student will have had an intellectual adventure which he can describe in writing. And such a description gives him an experience which he will obtain in no other way; by it he is introduced to the methods employed in the acquisition, preparation and analysis of material. Depending on the field and the type of degree for which he is a candidate, this exercise may represent: a small piece of research, the solution of a complex problem or design, a critical understanding of a sector of knowledge of considerable

dimensions, critical appreciation or creative work in literature or one of the arts. In no case need it be a small edition of the thesis for the Ph.D. (34, p. 121).

The *dissertation*, in contrast, is a major requirement for the Doctor of Philosophy degree (or its equivalent), and is universally a part of the scholar's professional training. Unlike the thesis, a dissertation problem is expected to be formulated by the student himself. The report should be a significant, even though it may be a highly specialized, contribution to knowledge. In the sciences a dissertation is a written report of research on an original problem; it traditionally terminates a year or more devoted exclusively to intensive investigative work; and it is defended orally before a public gathering including the senior staff members of the candidate's department, whose role is that of inquisitor. In most cases, publication in whole or in part is required. There is an increasing use of the microfilm medium for this requirement.

Selecting a Thesis Topic

One of the first professional problems encountered by the student while in professional training is the question, "How shall I select a thesis topic?" Probably only a minority of students find a ready answer on their own, yet eventually the crisis is passed. One may well wonder if it might not be surmounted with less anxiety and better training if the student were given some tutoring on the *how* rather than handed directly a *what*.

There are a number of possible answers to the question. An extreme one is the claim that if a student asks the question, he is not yet ready to attempt a thesis. Although everyone agrees that graduate work should be for those mature enough to undertake partial responsibility for their own instruction, this answer goes too far. It fails to provide the proper stimulation in which maturation may be expected to prosper. This extreme answer is more appropriate in relation to the dissertation, although the Ph.D. candidate also works under the guidance of a senior investigator. Suppose we answer the M.A. student's question by first considering one of our own.

What Is a Suitable Thesis? Many students are confused because they have not informed themselves about what sort of thing the department expects in a thesis. Frequently the first proposals are either insignificant (the term-paper cue) or too extensive (the dis-

sertation cue). The departmental faculty assumes the student will have inspected former theses. A better method would be a generalized official statement from the staff, included in a graduate information booklet or something of the kind. Since local requirements vary and thesis advisors oftentimes disagree even within a staff, no universally applicable answers are possible. Yet we venture some suggestions for the consideration of staff decision or, lacking that possibility, student-advisor decision.

1. The thesis problem *may be* an experiment; it *should be* an investigation.
2. It should provide the student with first-hand experience in library search and in collecting and processing raw data.
3. It should allow for the possibility of the student's trying out his own interpretations.
4. It should be required that the student do his own reporting, with counsel from the advisor.
5. Since points 1-4 represent major objectives, the problem itself should be sufficiently limited so that actual data collection does not require so much time that the student's training in investigative work is restricted. It need not be a new problem; it must not be too extensive. There is no good reason why it cannot repeat a previous study (see Schlosberg, 36).

In short, requirements for a thesis should be directed toward the primary objective of training in investigative procedures, and only secondarily toward the problem and probable results.

Selection of the Problem. With some decision on what the thesis should be, we again turn our attention to the student, M.A. or Ph.D., asking about a problem. If you would insure your own continued motivation, go to a prospective advisor with at least the kernel of an idea. Your own problem will likely mean more to you than one tossed in your lap. If you would ensure the enthusiastic support of your chosen advisor, select a problem within the area of his interests. Indeed, it is an imposition to expect support of a thesis problem if no available staff member feels himself equipped to sponsor your work.

Begin thinking about possible problems as early as you can. Be alert for hints about gaps, inconsistencies, and neglected areas in knowledge. These may be found in lectures, seminars, or reading.

Write them down when you find them. Keep a file of everything, even nebulous ideas. As your field of interest narrows and your thinking becomes more structured, organize your search. Differentiate the significant from that which fits into no pattern of research and no theoretical framework, or is likely to interest only the investigator himself. Search the better encyclopedic accounts or extensive literature summaries—e.g., *Psychological Bulletin* or *Annual Review of Psychology*—for specific suggestions of where research is needed.

Don't be disappointed if your first ideas are discarded. Discuss problems with several staff members and older graduate students. Out of the process of "batting around" your incubating ideas may come a more worthwhile problem. The first one, though discarded, has still served a purpose. With a generous assist from critical thinking, wide reading, and a nurtured curiosity, these procedures will eventually bring results. Indeed you soon may be wondering how to select the best of several possible problems.

Scheduling the Thesis

A Typical Master's Schedule. New graduate students indicate by their questioning that they do not understand how a thesis is integrated into the M.A. training. Each psychology department will have its own program and sequence. There is little standardization of detail, yet the following steps may aid a student who is curious concerning "how it is done" or they may possibly contain a suggestion for departments setting up or modifying the master's program.

1. *First semester:* Student takes core curriculum courses, and enters into a self-directed program for thesis-topic selection; takes every opportunity to discuss ideas with staff, colleagues.
2. *End of first semester:* Staff notes student's progress, accepts him for candidacy. Student is now free to elect an advisor officially and begin more intensive work. Continues courses during second semester.
3. *End of February:* Student and advisor have worked up a proposal which is "staffed" to take advantage of suggestions and criticisms by other professors.
4. *March–April:* Student conducts investigation.
5. *Early May:* First draft of report written by student, criticized

by advisor. Final draft submitted to one other staff member before final typing. Student remembers that professional typists are very busy at this season, so has made arrangements well ahead. He also has noted Graduate School deadline for submitting final typed copy.

6. *Late May*: Final oral examination; usually emphasizes thesis and thesis area questioning. Student is prepared to present a concise oral account of his "intellectual adventure."
7. *June*: The student is awarded his degree.

In larger departments, contributions from staff members other than the advisor may not be possible. Sometimes comprehensive examinations are fitted into the schedule, preferably so that no serious conflict results. The program may be extended, possibly as long as two years in all if the student is carrying part-time work.

A Typical Ph.D. Program. Schedules beyond the M.A. level are usually much less structured. In the two or three years of additional study, the candidate usually has several requirements to occupy his time. Course work may be continued, but this soon becomes secondary to other training. An exception may be the need to take courses in a related department leading to a minor of, say, 15 to 18 hours of credit. Language requirements (or, in a few universities, a substitute skill) must be met. A qualifying examination is usually required, but this differs in character and sequence in the training in different universities. In many departments research other than that for the dissertation is encouraged during this period (sometimes in lieu of the M.A. degree). There is a growing emphasis upon practical experience during the graduate training; this is especially true in the clinical and industrial field, but is not unknown for teaching, experimental psychology, and other areas. Residence regulations must be checked carefully, especially for the student who is working part-time. The final year is almost always a concentration upon the dissertation research, culminating in a monograph-like report and the oral examination. The Ph.D. candidate's requirements and schedule are usually directed by a committee rather than by an advisor.

Thesis Form and Style

Any university library card catalog will list a half dozen or more

modern guidebooks covering the mechanics of thesis and dissertation writing. The local graduate school has probably adopted one of them as "official" or "recommended." Some of them are quite good—we like especially Campbell (6) and Dugdale (13). However, the "style" (i.e., form) explained and illustrated in such guides is literary style. In many important respects scientific style, at least as represented by our journals, differs appreciably. That we require a graduate student to learn literary style for his thesis or dissertation, never to employ it again, appears to be a particularly cobwebby academic tradition. Some of the questions which will come up in regard to the report of *research* are not covered at all in the usual thesis guide.

In order to end this confusion, to contribute more directly to an integration of training, and to be consistent with the view that the thesis or dissertation is an experience in scientific creativity, we urgently recommend (1) that the acceptable or official form and style for the master's thesis or doctoral dissertation be as nearly like that used in the journals of the science as local conditions permit, and (2) that everything required locally which differs from this be confined to preliminary pages or the appendix.

Though not every master's thesis will be published, every thesis should be in publishable form. A thesis may be too long to be acceptable by an editor, yet it need not be. It is more pertinent for the M.A. student to demonstrate mastery of scientific investigation and reporting techniques than it is for him to combine in an awkward fashion a research report with an undergraduate-like term paper. If the problem requires a lengthy historical sketch, if the advisor or the staff insists that the student demonstrate his mastery of the field in writing, or if the student is mature enough to undertake a literature-summary type of thesis, then such material should be presented appropriately. This would mean in the form of two articles in series if both the review and the report are required. If it is considered desirable to include raw data for future reference, such tables or other records may well be included in an appendix.

It follows from our point of view that no further suggestions on the writing of a thesis or dissertation are required. The graduate student should refer to Chapter 6 for information on form and style, and to Chapter 7 for the mechanics. He may also find useful the APA manual (A 159) and the Conrad (11) guide for mono-

graphs. The suggestions he will find in all these sources are equally pertinent to published reporting and thesis reporting.

A final word of clarification on the point in regard to the doctoral dissertation: The candidate approaching the writing task should take his cue not from the typical journal article, but from the typical monograph. Unfortunately, he may not be able to afford publication in this form, in which case a rewriting is necessary. If, however, scientific style details have been the rule, the rewriting task may be no more strenuous than cutting and editing.

THE ABSTRACT

The *abstract* is a kind of summary, *résumé*, or condensation; it is appreciably shorter than the original from which it is prepared; and it covers the salient points in a concise manner. It should not be confused with the *abridgment*—another kind of summary—which has been shortened somewhat from the original by deletion of some material. The abstract is a *rewrite* of the original.

Kinds of Abstracts

At least three types of abstracts are familiar to the psychologist: (a) the published abstract of a published document, (b) the working abstract prepared for some specific bibliographic purpose, and (c) the published abstract of a paper delivered at a scientific meeting. Although all of these may be subsumed under the description just offered, there are enough differences to justify their separate consideration.

Published Abstracts of Published Documents. This type is best exemplified by the familiar form of abstract appearing in the *Psychological Abstracts*. In this journal, as in most abstract journals in science fields, abstracts are descriptive or indicative and not evaluative. Descriptive abstracts are used for material such as elementary textbooks, collections when treated as a whole, obituaries, bibliographies, and the like, which are publications not reporting the results of research or theoretical concepts. These types of publication should have an abstract which indicates the scope of the material and briefly reports all new points of psychological interest contained in the original. Emphasis is made in the same way (i.e., proportionately) as was done by the original author and the points appear in the same sequence. A restatement of the major methods, ideas,

concepts, principles, and conclusions is attempted. The abstract writer keeps in mind his role in bringing out important items not covered in the title of the article, since this procedure aids in its proper indexing and its fullest usefulness.

The length of the abstract is not rigidly delimited. In *Psychological Abstracts* the average length is about 150 words in the body of the abstract. However, it might be more or less than that depending upon such factors as the significance of the material for the science of psychology (see the four levels of usefulness discussed in Chapter 4) and the availability to psychologists of the original.

Jones (21) discusses steps in the process of preparing a good abstract:

1. Read through the article rapidly for an overview.
2. Reread carefully, checking or making notes of the important points made.
3. Make an outline from the notes.
4. Write the outline into a rough-draft exposition.
5. Rewrite in more polished style.
6. Effect shortening by the economy of words in sentence structure rather than omission of thought units. However, avoid "telegraphic style."

Experienced abstracters undoubtedly develop a method to their own liking, but these six steps provide a useful guide for those others who wish to achieve proficiency in the preparation of the abstract form of scientific report. For formal abstracts to be submitted to the *Psychological Abstracts*, a form-sheet and brief manual have been prepared by the Editor (22).

The functions of abstracts when published in a collected form must be apparent to the reader who has studied the preceding chapters and need only be listed here: (a) to aid the researcher in finding needed material, (b) to serve as a standard reference tool in library work, and (c) to serve as a permanent historical record of the literature of the science. Valuable as the *Psychological Abstracts* may be, neither the journal nor any of its items can be used as a substitute for reading original material. A little practice at writing abstracts will reveal how much must be omitted. The minor details, suggestions, asides, and the like, which drop out in abstracting, may be the very thing furnishing a researcher with inspirations or hypoth-

eses in his own work. "Keeping up with the literature" is not really done properly by reading abstracts alone. Such is not their purpose.

The Working Abstract. No accurate description of form for the working abstract can be made for the obvious reason that a great variety of purposes may be served. The student or scientist preparing material for his own use may even stop after step 2 of Jones's suggested procedure. Although we could scarcely refer to the result as an abstract, it may nevertheless serve some of the same functions.

When a graduate student or assistant is required to prepare abstracts for a professor or a researcher, he should plan to carry the preparation through step 5, at least. He will be expected to use great care in preparing accurate citations. Brevity will not be so important a consideration in this case as it would be for a published abstract. In fact, a longer abstract may be desirable.

Published Abstracts of Orally Delivered Papers. Custom varies from time to time and from one organization to another in regard to the form of this type of abstract. In recent years papers accepted for inclusion at sessions of the annual meeting of the American Psychological Association have been published in abstract form in the issue of the *American Psychologist* immediately preceding the date of the meeting. Such abstracts are longer than those in *Psychological Abstracts*. The maximum length is 300 words. They are prepared by the authors of the papers and submitted to the program committee at an early date as a basis for selection and program arrangement. This abstract follows a well-defined outline made up of four sections: problem, subjects, procedure, results.

THE BOOK REVIEW

Somewhat related to the abstract is the book review—that is, the book review contains some of the same elements and serves some of the same purposes as does the abstract. However, an important difference exists in the fact that a good book review does more than inform the reader of contents; it provides evaluation, criticism, and orientation.

Qualifications of a Book Reviewer

Certain qualifications which should be met by the person who writes a book review appear so obvious as scarcely to justify our

listing them here. Particularly is this true when we plead that no one publish a review of a book *he has not read*. It is an insult to the reader when a well-known psychologist takes up valuable journal space to discuss his personal aesthetic experience upon viewing the color or other details of a book's paper jacket. Not much better is the reviewer who scans a table of contents, then favors the reader with his wisdom concerning what should have been included.

Turning to the more positive, we would ask that a reviewer (a) possess a good knowledge of the field covered by the book in question, (b) have the ability to analyze material and penetrate content for wider implications, and (c) know how to exercise a reasonable, objective standard of value. These requirements raise some interesting questions concerning relationships between reviewing author, reviewed author, and the subject matter in which they both presumably specialize. The habitual reader of book reviews can scarcely fail to be sympathetic with Boring's appeal for more reviewers "whose ego-involvement has been replaced by the wisdom of maturity. . . . A reviewer should be a gentleman," he writes, "[being] allowed his anger, but neither frustration nor neurosis" (2).

The Functions of a Book Review

Functions for the Reviewer. Writing reviews, whether done for actual publication or not, serves the writer by contributing to intellectual growth and broadened experiences. There is a considerable gap between the returns from reading a book and those from studying a book sufficiently well to write a good review. Assuming that a book represents scholarly effort, intensively or extensively applied, a reader can compound his returns through careful considerations beyond a first reading. Through the book review, then, there is the opportunity for a real broadening of viewpoint and stimulation from another writer's creation. Of secondary importance is the reputation one might build for good reviewing. Monetary considerations are negligible or absent. Some journals pay small fees for reviews of important books, and of course the reviewer's copy of the book is generally retained by him without payment.

Functions for the Author. The effect of reviews upon book sales is highly varied and problematical. In certain literary circles, a "Boston ban" is a guarantee of successful sales. In scientific works, reviews appear so badly delayed after publication that frequently the

book's fate has long since been decided. However, it is reasonable to suppose that any review is potentially a factor in book sales, and thus its tenor is of direct concern to the author.

For this reason especially, irresponsible reviewing is abhorrent to the psychologist's sense of fair play. Scientific book writing, with a few exceptions, is not the most lucrative endeavor open to the psychologist, yet its continued practice is essential to the progress of the profession. A tabulation of "favorable-unfavorable" ratings in the book reviews indexed in *Psychological Book Previews* shows a rather marked lack of agreement in those cases of multiple reviews for a single book. Out of 703 review citations scanned, there were 117 pairs where comparison of different reviewers' opinions is possible. Among these pairs disagreements outnumber agreements 2 to 1. Some are honest differences of opinion. No doubt others result from books' being considered for entirely different purposes. In fact, difficulties arising from this situation led the Editor to drop the ratings. However, one cannot discount the possibility of serious unreliability in present book reviewing practice.

Functions for the Reader. For the profession as a whole, and for intelligent laymen, reviews of psychological books serve as an invaluable survey of a large selection of books, most of which one cannot hope to read. Through reviews the psychologist finds the books pertaining to his special interests and benefits by the opinions of his fellows. In the case of the teacher, especially the inexperienced teacher, reviews of textbooks aid in the decision of what text to adopt. Reviews offer the advanced student a screening of books he might use for supplementary reading or addition to a personal library. These functions are served more or less efficiently, depending upon the quality and integrity of reviews.

The Content of a Book Review

Boring (2) has pointed out the three basic purposes of the book review: (a) to provide an abstract, (b) to present an evaluation, and (c) to give the reader an orientation. The review writer need not follow this as an outline, but should adequately meet all of the purposes.

The Abstract Function. The review should tell the reader more about the book than he would expect to find in the typical abstract item. It should not merely recount the chapter titles but provide an

integrated overview. Usually the abstract portion can be presented free of criticism. The purpose of telling a reader *what the book is about* should be the first goal of the writer. Some of the points the reader is interested in knowing about the book are a general description, the purpose and scope, special qualifications of the book's author, and a summary of the contents. All of these are best presented in a straightforward, unbiased manner.

The Criticism Function. Positive criticism usually does not give the reviewer much trouble. It should be brief, factual, and informative. Complimentary comments should not be "flowery" and should not resort to flattery. *Appreciation*, which may be appropriate in literary reviewing, has little place in the scientific review. The reviewer must carefully distinguish between evaluation of the author's objectives and evaluation of the achievement of those goals. Negative criticism, when based solely upon the reviewer's notions of what the book should have been, must be more carefully handled; as Boring says, "it should be spelled out," and it is at its best "when the reviewer manages to state descriptive facts and to leave the reader to attach his own values to them" (2). Any negative criticism must be carefully documented to avoid the countercriticism of prejudiced reviewing. Informed, mature, courteous, authoritative criticism harbors no personal grudges, no "I could have done it better" implications, and no building up of petty, inconsequential trifles.

Writing the kind of impersonal criticism we would most like to read in a review involves some of the skills we have discussed elsewhere for writing any scientific material. Since brevity characterizes most reviews, these principles become even more important.

Evaluation of the following specific aspects of the book should help strengthen a review:

1. Does it have a satisfactory physical appearance throughout?
2. Is it well indexed?
3. Is it adequately documented with a useful bibliography?
4. Is the book itself critical? Does it give proper balance to material included?
5. Is it well organized?
6. Is it complete, thorough, accurate?
7. Is it written from knowledge of original sources?
8. Does it satisfy the goal or purpose its author has stated?

9. What new value does the book have for the science?
10. How will the book influence the field of psychology?

The Orientation Function. The final points in the list above reflect Boring's plea for a "quota of wisdom [added] to the contribution that is the book" (2). This may be an historical orientation, a comparison with contemporary works, a prediction of the book's imprint on the field, a discussion of the implication of the author's contribution to theory or practice, or evaluation against some other frame of reference. This content, more than anything else, makes the review a scholarly contribution.

Book Reviewing and the Graduate Student

Although the graduate student may consider himself not yet qualified to prepare a book review for publication, he may profitably practice this kind of scientific reporting. Training in the type of analysis and critical evaluation needed in reviewing should offer considerable stimulation for professional growth. Development of a vehicle for "local consumption" of student-written reviews could be a profitable project for graduate psychology clubs. The book review seminar and the informal news sheet or student journal are examples. Perhaps, in reviewing such volumes as textbooks, the superior graduate student may supply even a more valuable point of view than would his professors.

SCIENTIFIC CRITICISM

Apart from book reviewing there remains the problem of scientific criticism in general. The critical attitude is indeed fundamental to a thoroughgoing scientific rigor. The graduate student typically encounters it early in his professional training—in seminar discussions, thesis planning, oral thesis examination, and other situations. Criticism is further encountered in the discussions following the reading of papers at professional meetings, informal evaluations of published material, and the published critique of a journal article. The ability to anticipate and offer rejoinder to such criticism should be considered in professional training along with the attitude and practice of objective skepticism.

Controversies and critiques comprise a fair share of space in our journals. Although some of these have been carried on beyond the

limits of profit, in general the contribution is worthwhile. We do need a code to govern the ethics and graces of reasonable criticism. Journal editors are concerned about decisions they must make with such material. Surely it is clear that the approach should be impersonal, the tone courteous. The practice of submitting critical manuscripts to the person whose work is criticized in order that he may prepare a reply would be generally accepted as a basic tenet in such a code. Seeley (37) has considered the traditional canons of criticism and discards each point as unsatisfactory. Balancing a "bad" statement with a "good" one "makes criticism a kind of ritual dance," he says; discounting one scientific error in a scientist otherwise sound is a practice which ignores the truism that "whatever serves truth serves all else"; the view that it is foolish to make enemies smacks of "how to win friends"; that criticism must be constructive implies that the critic must atone for his effort; the ban on a critic's enjoyment of criticism contradicts the view that adjustive mechanisms may be healthy, he believes. Instead, Seeley suggests a simple requirement that the criticism be merely valid, cogent, clear, and impersonal; that it have no scurrility; and that the critic "stick to his last."

The problem deserves more attention from psychologists. What kind of criticism will contribute the most to progress of the science? How much should we publish? The APA code of ethics states simply that criticisms should be made fairly, they should be carefully documented, and that the focus of attention should be on the work rather than on the author. It is entirely consistent with the intentions of the Ethics Committee and the action of the Association (discussed in Chapter 11) that we ask if there is not a need for more thought on this problem.

THE MOTION PICTURE

It may not have occurred to the reader that the motion picture film is a type of scientific reporting. As a matter of fact, there is at least one instance of the use of a regular instructional film form as the vehicle of report (32). Psychologists have sometimes used films as a supplement to papers delivered at scientific meetings. There are also cases of the use of films within the research situation (e.g., 17). The use of films in psychological testing is a technique only tentatively touched as yet. Finally we would mention for further consid-

eration the typical instructional or classroom film as a problem of scientific reporting. Although such films do not substitute for written or oral material, they share the need for clarity in scientific communication. Furthermore, when exploited properly, the motion picture can do considerably more, at least for some subject matter, than the oral or written report. The fact that an instructional film is directed at a particular audience (students, usually) does not to our way of thinking alter the basic fact that its purpose is the communication of scientific information.

The Problem of Photographic Technique

Home movies have become so common in recent years that almost any group of psychologists will include someone familiar with this type of photography. Unfortunately, amateur movies often are no better than the snapshot variety of still photography. Far too many of our available instructional films in psychology reflect this limitation. There is apparently no relationship between skill in psychology and skill in photography! The value of films is well established experimentally. Psychology needs improved instructional films. We take the position that a psychologist can learn enough photography more easily than a photographer can learn enough psychology. Of course, a co-operative relationship between scientist and photographer would provide a superior solution, and this arrangement is to be chosen where funds permit.

Films of a quality comparable to what is known to the trade as "advanced amateur" level are technically adequate (or better) for instructional purposes. Indeed, it has been shown that the special effects of photography we associate with Hollywood creations do not generally add to the effectiveness of scientific communication (25). There is little excuse, then, for our using this reporting medium so little, and with such generally inferior results.

The reader will have recognized some exceptions to our sweeping complaint. The good films on psychological topics have usually had expert photographic advice or have been made by some military organization with extensive facilities. The homemade films could be made much better—even satisfactory—with a little more care in their manufacture. Two criticisms are outstanding: the lighting is often poor and the picture is usually cluttered with distracting detail. Any photographic store or your library can supply good in-

struction books covering these techniques. McKay (27) has edited a small guidebook for the amateur cinephotographer. Offenhauser's books (30, 31) are good examples of fine reference material available. A recent text by Spottiswoode (40) gives excellent coverage of techniques from idea to projection for the instructional or documentary film. No serious filming should be undertaken without a fair mastery of movie technique. The production of a suitable, effective film is a satisfying job. The medium deserves wider usage and greater attention by psychology.

Effective Communication through the Film Medium

Photographic quality is a prerequisite for effective moving pictures, but it is not a guarantee of communication or that behavior will be modified. Research indicates that we have only begun to exploit the capabilities of the film. In 1947 an intensive effort to discover the significant variables in effective film instruction was begun as a government-sponsored research project under the direction of Dr. C. L. Carpenter at Pennsylvania State College. Although the work continues, certain positive results have already been obtained. From several of the project reports (8, 9, 19, 25) the following suggestions have been selected as representing demonstrated conclusions which pertain to the construction of films and to their use in scientific communication. Although it is not the purpose here to provide a manual for film making, those who wish to try their ideas in the movie medium may apply these points advantageously.

Film Production. Closely related to the appeal for greater personal reference in writing (discussed in Chapter 6) is the fact that a film, too, is more effective if it somehow manages to create in each member of the audience an illusion of personal participation. A method of doing this which is both effective and easily arranged is to use a 0° camera angle—the subjective angle. This means simply that the camera is positioned throughout as if it were one of the participants in the action. Translated into the report of an experiment, this might be handled by thinking of the camera as the eyes of the experimenter and arranging the script to develop the notion of identification of observer with experimenter. In films on clinical subjects, the subjective viewpoint might be that of either clinician or client; either would be superior to that of the usual third person, an intrusion in the clinical relationship.

A film which satisfies those who are experts in the content portrayed will not necessarily be effective in teaching novices. Although psychologists may not always be able to evaluate a film in the progress of manufacture, certain features will almost surely aid the desired result without being further tested. The *development* of the theme should be *slow*—much slower than the expert would expect. The objectives should be limited, the portrayal restricted in breadth, and difficulty level narrow and internally homogeneous.

Exploitation of the medium should involve an emphasis upon those things which a film can do best. Let those features reinforce other accounts of the material rather than attempt to tell the whole story by means of film. Carpenter (9) has enumerated some specific instances where films may produce learning better than other media: where action is significant, where greater realism is needed, where space or time must be bridged, where complex behavior needs to be clarified, where the camera can see more clearly than could the eyes of the group, and wherever the co-ordination of visual-auditory stimulation will be forceful.

Sound tracks added to the film are helpful, but apparently not absolutely necessary for all types of pictures. Commercial firms are equipped to do this on 16-mm. movies, the size which is now standard for instructional films. Sound is clearly secondary to visual teaching; when used, it should serve mainly to direct attention within the picture development. Too much as well as too little commentary in a sound picture has been found unsatisfactory. Musical backgrounds make no real contribution to instructional films. Color is of no value unless color is critical to the information displayed.

For effective learning of important points, the film should be designed around principles of clear perception. This would mean that the producer plans in terms of orderly sequences, easy transitions, sufficient time for each scene, the abundant use of stimulus depth clues, repetition with variation, absence of distraction and distortion, and, finally, the use of as many already familiar things and situations as possible. Such devices counteract, in part, inherent limitations such as flatness and enforced pacing of perception.

Film Utilization. Although experts on visual education disagree about many of their problems, they are unanimous in abhorring the use of the movie as a "fill-in" device. Research of the Pennsylvania group also shows that students "learn to learn" from the movie

situation. The infrequent use of films is relatively ineffectual; returns are cumulative.

Other aspects of the *casual* classroom use of movies give further understanding of our failures and dissatisfactions with instructional films. Too many instructors are likely to attempt their use as entertainment or easy teaching. Like any other effective teaching, films provide no relaxation of instructor effort. Reports from the Instructional Film Research Program emphasize the need for relevant orientation and summary at the point of use. The teacher needs to plan this very carefully; indeed, he needs instruction in the proper utilization of films. It would appear that a really adequate film might be supplied with a teacher's manual to facilitate greatest effectiveness.

Since most students are inclined to associate the movies with entertainment, the announcement of a film showing may result in relaxation of a learning attitude or the encouragement of passivity. Such an effect must be countered by emphasizing intention as a learning variable. A quiz on the film may be announced beforehand. A discussion may be introduced as a regular and expected follow-up. Any technique for inducing audience participation after or, even better, during the showing enhances intention and other learning dynamics. A film depicting an experiment, for example, or a clinical interview might effectively be stopped at a critical point. The audience would be asked, "What would you do next?" The challenge induces participation and identification. Resumption of the film provides quick knowledge of results. An experiment (28) from the Yale Motion Picture Research Project (24) has demonstrated that simple motivation and participation devices increase the learning from a film by about six percentage points. Many other learning devices should occur to the teacher seriously interested in improving film instruction.

THE ORAL REPORT

No psychologist who has attended professional meetings needs to be told that *other* psychologists frequently fail miserably in the oral communication of scientific information. Poor performances result in considerable complaint, in not a little writing on how it should be done, and in at least two investigations in the matter at APA

conventions. If there is any improvement as a result, it is hardly yet noticeable.

The Complaint

Papers read by scientists are too obtruse, dull, monotonous, obscure, mumbled, verbose (14). They are prepared for publication and not for reading; the audience is ignored (23). Pronunciation is slurred (5), speech is provincial or rustic (15), and delivery is too fast, not loud enough (4). The speakers ignore their time limit, fail to organize their material (12), and indulge in annoying habits like starting off with an apology (4). And worst of all is the scientist whose paper "consists of trivia, errata, omissia, et cetera; mostly et cetera" (12).

The Cure

DuBois (12) suggests that the responsibility rests with the chairman of the department represented by the speaker, but fails to tell us what we should do about poor chairmen-speakers. As a more serious recommendation he says "the time to start training is when a man is young" and he goes on to outline a program of training actually attempted in a certain medical school. Forbes (15) makes a good case for requiring speech training in the doctorate program. We might add that skills in oral communication of scientific material will be used more than will skills required in the translation of foreign documents. Furthermore, the scientist can purchase the latter service; the former he cannot.

Forbes's suggestion is clearly in sympathy with the viewpoint expressed at several points in this book. The graduate student *should* be given an opportunity to learn and improve speech delivery, not only for the limited case of convention papers, but as training for lecturing, public speaking, and other requirements. In Chapter 13 we shall discuss the need for training teachers of psychology. Larger graduate departments are introducing courses, seminars, and practica on teaching, which include attention to oral delivery.

But to return to the scientific paper. In most departments graduate students present papers at seminars. Is it not appropriate that the teacher or staff give attention to the manner of delivery as well as to the content? When such a procedure is expected and under-

stood, the graduate student will not resent or be disturbed over a private session with his advisor in which suggestions are made. Indeed, the graduate student might reasonably request such help. Practice in the specific techniques of delivering convention papers might well be handled by planning certain seminar meetings devoted to conventionlike sessions. Some, if not all, of the regional societies encourage papers by graduate students. No doubt, other methods of training and experience are possible.

The Formula

The problem is a serious one. As a rule, important research is presented at conventions; important research deserves a higher quality of transmission. The following positive suggestions are offered in the hope that they may be used by being integrated into some kind of actual training program such as suggested in the preceding paragraphs.

Preparation

1. Work from an outline.
2. The principles of readability are even more important in "hearability" because the audience cannot recheck.
3. The classic principles of unity, coherence, and emphasis are still good.
4. Language may be more vivid, colorful, and informal than in the printed report.
5. *Most important:* limit the content to the major part of your investigation. You are not expected to include every side-light, minor issue, or procedural detail. One main idea, clearly exhibited, is a reasonable goal.

Practice

1. Delivery before an audience will take longer than will practice delivery when alone or even with a single hearer. Experienced speakers cut a planned 15-minute paper until it can be given in about 12 minutes in practice delivery, and a 10-minute one until it can be given in 8.
2. Practice before a group is superior to practice before one person. "Trying it out" on departmental seminars is a good plan.

3. Become so familiar with the material that most attention can be given to the audience.
4. Record the delivery on tape or wire and play it back for self-criticism.

Delivery

1. Keep the pacing slow. Material is not as familiar to your audience as it is to you.
2. Make full use of variety—in pace, emphasis, inflection, and volume—to hold the audience.
3. Set the proper minimum volume for yourself by speaking first to the person farthest away.
4. Maintain an air of easy informality; follow a pattern of “amplified conversation.”
5. Give some attention to the elimination of distracting movements, nervous habits, and the like.

Some Decisions

There remain two problems which the speaker will need to decide for himself beforehand, since there is less agreement on them than there is on the matter of complaint, cure, and formula. One of these is the use of visual aids for presentation of data in the oral report. One might add that they are sometimes misused. Three modes are usually available—writing on a blackboard, projecting slides, and passing out mimeographed material. The first is not to be recommended for the 10- or 15-minute paper since it requires too much time away from the delivery, unless the material is very simple. Slides necessitate rather careful preparation and the conditions for presentation are often far from ideal. The mimeographed hand-out is becoming increasingly popular because it has certain advantages.

Slides are preferred by many speakers. They should be prepared by someone skilled at lettering and drafting, or by one of the methods recommended in Chapter 7 for the preparation of figures. Nearly every university has facilities for the photographic process required in converting the large original to a transparent film-glass-plate sandwich. The larger size, $3\frac{1}{4} \times 4$ inches, should be chosen rather than the newer 2×2 inch miniature size, since projection facilities are more likely to accommodate them at adequate screen size. Type-written slides are frequently not legible. For satisfactory legibility,

lettering should be somewhat larger and lines somewhat thicker (in relation to over-all size) than would be the case for a figure reproduced in a journal article. Several slides are better than one slide with too much material on it. Graphs and bar charts are better than tables, since their interpretation can be made by the audience with greater ease; they compete with the oral delivery much less. The speaker should usually not attempt to put across exact data, but only trends. The graph requires less exposure on the screen and less consideration by the speaker for clear audience perception. Audiences dislike a speaker's reading off every bit of information on the slide. "A good slide needs no pointer or verbal explanation" (12). Probably the most serious difficulty with slides lies in the inadequacies of controlling room lights in most convention locations. Further observations on slide making and slide use may be found in the comments of DuBois (12) and Van Pelt (43).

Use of mimeographed sheets has the advantage of avoiding the difficulties sometimes found in presenting slides ("convention hazards," as Reid [33] calls them). Interested persons in the audience may carry the material away for more careful study later. Mimeographing requires less specialized skills in preparation. Unless they are retained by the speaker (or, better, an assistant) until needed, the hand-outs may offer more competition with the delivery than should be tolerated. Passing around a single exhibit is bad practice, since it cannot be observed by everyone at the moment the speaker is considering it. At every other time during the paper it is a potential or actual distraction.

For the second decision, even less may be said by way of recommendation. Will you elect to read your paper or deliver it from limited notes (or with none at all)? If you choose to read it, you will be following tradition and you will have able support in the article by Reid (33). If you feel that you can do a better job the other way, you will find yourself in sympathy with the remarks of Lucke (23). No single solution is possible; each speaker should discover for himself the better system. Certain difficulties with the read paper may be overcome without abandoning the form. Read papers must be written to be read aloud, not written like an article to be published. Readers must maintain contact with the audience; they must not bury themselves in the manuscript. Badly read papers suffer from the criticism of being discourteous to the audience; the other kind is

frequently poorly organized, rambling, repetitious, and too long. So far as we know, there is little audience preference between a paper that is well read and one that is delivered well either with or without notes.

And a Bit of Anxiety

Many graduate students facing a public appearance for the first time, and not a few of their elders doing it for the *n*th time, are concerned over their own dreaded anticipations and stage fright. Psychologists should know how to apply a bit of self-therapy to the problem, one might suppose. Yet there is no evidence that psychologists experience this disturbance any less than other professional people.

As a matter of fact, there is reason to believe that a mild degree of tension facilitates performance. If we can generalize the learning-muscle tension studies, it would appear that there might well be an optimum tension-anxiety level. Too much or too little would be expected to result in less than the speaker's best performance. A rather large proportion of persons in creative work report they do their best work under pressure.

It is therefore for the extreme case that we offer a few specific suggestions. One might achieve a degree of comfort from reading the dramatic account Mosso has written of his own first experience at the oral scientific reporting (reproduced in Young, 41, p. 367). The reminder that one's unpleasant experience is shared by many others is good therapy, here as elsewhere. Telling oneself that one has friends in the audience and after all the speaker himself knows more about that particular paper than anyone else—these reminders may be anxiety reducers.

SCIENTIFIC REPORTS WITH LIMITED DISTRIBUTION

We can do little more than enumerate the several types of reporting where distribution and function are restricted. Special problems are many, but local. There are extensive variations of style. In most cases the limited report is not unique to psychology nor even to scientific work, yet the psychologist finds himself called upon from time to time for such writing and may need reference assistance.

Brief reports of investigations, surveys, and the like for a university dean, a faculty committee, a professional association, a govern-

ment unit or agency, or others may be effectively handled in the form of a letter. Longer reports will need to be organized into sections and will resemble the thesis and the permanent manuscript discussed in Chapter 7. Jones (21) presents a detailed treatment of report writing in his Chapters 11-13. One should, of course, always check to see if the requesting agency has issued a standard report form.

Undergraduates frequently inquire about the desired form for a term paper. McCrimmon's text (26) on writing, although designed for freshman students, is one of the best books for the novice. Many formal guides for theme writing are also available. The instructor who announces papers as a course requirement can save himself many grading and reading troubles if he will also indicate an available acceptable guide. If the English department of his school has systematically taught theme writing from a standard guide, he will be doing the student a favor by accepting the same authority. In the absence of such a program, the selection of the guidebook by Grewe and Sullivan (18) is recommended. In psychology laboratory courses, students' experiment or project reports are notoriously "sloppy"—mostly for lack of a standard guide. Brief departmental mimeographed instructions will be found of considerable help in making reports more uniform and thus will aid in removing one of the major sources of unreliable grading. The little manual by Israeli (20) should be of some help in this connection.

Clinical case reports represent an additional example of the limited-distribution report. Standard texts in clinical psychology offer very little information on form or content. Rosenzweig's treatment (35, Chapter 8) is useful, and Menninger's work (29) on the psychiatric case study has a very informative chapter on the writing of case reports. In a brief note by Foster (16) there are four specific suggestions which should be considered in reports to psychiatrists. Psychometric report blanks have been published from time to time. However, the run-of-the-mill case report is too often seriously deficient in communication effectiveness. Until recently, there has been no thorough effort to improve a situation clinicians generally believe to be unsatisfactory. Reports are made to parents, schools, institutions, physicians, psychiatrists, social agencies, government agencies, and other referring sources. In the typical clinical team organization each member makes a report to the group conference. Hammond and Allen (18a), after study of the problem, have

prepared a guide book not for a stereotyped form for these diverse purposes, but to "procedures which will be the most useful . . . in reporting [clinical] findings accurately, forcefully, and understandably. . . ."

WRITING FOR THE PUBLIC

Psychologists are gradually becoming more aware of the need for the communication of developments to the layman. Our public relations are not as good as those some other fields enjoy. Several writers concerned with this problem have pointed out that the public deserves scientific information; the public supports research, directly or indirectly, and it needs to have useful or interesting information made available. Psychology as a profession will profit in obvious ways from an informed positive attitude toward the science. Pertinent to this problem is the statement of Buckle, quoted by Boyer (3), that "when the gulf between intellectual classes and the practical classes is too great, the latter will reap no benefit, the former will possess no influence."

There are two ways by which this difficulty may be eased. Psychologists could do more popular or semipopular writing, just as we now do a great deal of public speaking. Most of us would need to learn how, because we have been trained for other kinds of reporting. At first we would trip over our technical vocabularies, our misjudgments of what is interesting, and inaccurate estimates of reader knowledge and/or intelligence. But we *could* learn. There are several good sources, including a chapter by Woodbury (44) and another by Clark (10) in books on writing. There is a discussion of 17 "don't's" by Slosson (38), and still other useful sources (e.g., 39, 42). One of the finest jobs of this kind of reporting in recent years is being done by *Scientific American*. Careful study of its style and format will repay writers interested in developing the techniques.

Many scientists have neither the training nor the inclination for popular writing, but if they inform themselves about the problems involved they should be in a better position to co-operate with those who specialize in such writing. Although it is a frequent complaint that newspaper science stories are inaccurate, distorted, and overly dramatic, such is not inevitable. Reporters who are members of the National Association of Science Writers attempt to follow a rigorous code on these matters. Science reporters, in appeals to sci-

entists for better co-operation (1, 7), have pointed out the newspaperman's problems and have suggested methods by which more effective communication might be established. The team approach (professional scientist plus professional writer) is entirely consistent with present methodology within and among the sciences. Scientific writing for the layman deserves greater attention from the psychologist with a view toward improvement of both these approaches.

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PART IV

Problems of the Professional Psychologist



CHAPTER 10

Fields of Psychology

Psychology has an unusual, perhaps unique, status among the sciences. It is less than a century since experimental study of mental phenomena replaced the contemplative analysis of rather casual self-observation; and it is scarcely fifty years since experimental attention was first directed to behavior in a wide sense. During the period that the science of psychology has been developing, applications of its data to practical affairs has also been growing, frequently at a rate which threatens to outstrip the science. Two World Wars have each given significant impetus to the science as well as to the applications of psychology. Now at mid-century the central core of psychology is fairly well recognized, its relations to other sciences are becoming clearer, and there is a recognizable maturity in its approach to its scientific problems.

The situation in relation to the applications of psychology is less stabilized. To speak of current conditions as confused is too severe; they are best thought of as being intentionally unstable so that thoughtful experimentation may lead to an effective structuring of a new art or kind of engineering. For the student now entering the field of psychology there is a very promising future. However, it is neither possible nor wise to reach final or absolute decisions as to special goals. World War II saw educational psychologists become clinicians, theoretical-learning specialists engage in training problems, clinicians work as test specialists, and so on. The great possibilities of similar demands in the future argue for the importance of sound training in scientific psychology which may be profitably utilized in many kinds of situations.

SCIENCE OF PSYCHOLOGY

Psychology as a science has progressed through the three phases which can be found in the history of all sciences. It is yet so young that the three phases are apt to appear simultaneously more frequently than one finds in such subjects as physics and chemistry or even in the biological sciences. The work of Greek thinkers and those who followed them for over twenty centuries might well be considered as a naturalist phase. Although behavior was casually a matter of concern, the great interest was in the observation and interpretation of mental phenomena. Observation was usually that of the thinker's own mental life with some extension to the mind of other persons, and to a small extent to animals. It was not until the nineteenth century that the approach to problems of interest to psychology became experimentally empirical.

The "new experimental psychology," which found its beginnings in the work of Fechner and its greatest growth with Wundt, was concerned still with mental phenomena. However, it approached its problems with methods of systematic investigation of phenomena which earlier had been the subject of naturalistic observation. In the latter years of the century attention began to turn from mental life to a consideration of behavior of the organism. This interest grew in part from the work of physiologists and in large measure from the interest aroused by the Darwinian theory in the problem of mental development in animals. With such English writers as Romanes and Lloyd Morgan the observations were almost entirely naturalistic with only casual attempts at systematic experimentation. In the early twentieth century this interest in behavior became much more crystallized, with Watsonian behaviorism being the rallying point. This phase is characterized, whether the subject of investigation was mental phenomena or the behavior of total organisms, by refined systematic exploration with the use of apparatus and other measuring instruments.

The final phase is one which has become prominent only within the last decade. This phase continues systematic experimental investigation, but more and more experiments are designed to explore hypotheses established on rational mathematical bases. Although this sort of work appears with increasing frequency, it is difficult to name leaders; factor analysis, especially the work of Thurstone,

is one aspect. The developments of Rashevsky and of Hull are also within this phase.

These phases which one can trace in the history of psychology are not, of course, mutually exclusive either in time or in content. They all exist and have value in the present. It is important to recognize them, however, because there is no reason to believe that psychology as a science cannot follow a path similar to that of other sciences so that more and more its progress will be rational rather than empirical alone. This trend would seem to argue for greater preparation of students in the field of mathematics, in particular, and for an adequate acquaintance with scientific methods as found in the physical or biological sciences.

APPLICATIONS OF PSYCHOLOGY

The possibilities of the practical use of information gained in psychological laboratories was recognized, for example, by Cattell and Witmer, as early as the 1890's. Binet's development of a scale for measuring intelligence gave a very real impetus to the whole area of measuring abilities, especially after it was available in a translation by Goddard in 1911. The development and use of measuring instruments for a wide variety of psychological characteristics has increased continuously since the beginning of the century. Much of the beginnings and history of psychological application centers around the methods of measurement. These have been used in industry, in education, in vocational and educational guidance, and in the clinical consideration of behavior deviations. By the mid-twenties and early thirties applied psychology began to broaden and to include interests other than those centering in measurement as such.

The interest of individuals, the acceptance in many areas of public affairs, and the development of new methods and theories have all led to an increasing amount of specialization in applied psychology. It is evident that the data and methods may be common to two or more applied fields, but distinctions are made. These are evident in the Divisions of the APA. Although individuals affiliated with almost any of the Divisions may be interested in applications of their knowledge, at least eight of the Divisions are primarily applied in nature. These include the Divisions of Clinical Psychology, Consulting Psychology, Industrial and Business Psychology, Educational

Psychology, School Psychologists, Counseling and Guidance Psychologists, Psychologists in Public Service, and Military Psychology. In addition the Society for the Psychological Study of Social Issues is interested in applications of social psychology. In large measure these various specialties have grown up together and the training for them has a great deal in common.

The student who has reached a decision that his interests lie in an applied field should definitely plan as early as possible to ensure a program which will give him knowledge of the non-psychological aspects of the area in which he wishes to work. McQuitty (18), in discussing problems of developing applied psychologists, points out that much of the success of psychologists in military work during World War II is to be attributed to the fact that they learned military requirements so that they could utilize their psychology within a familiar framework. He proposes that the value of psychologists in industry, in business, in mental hygiene or other social service agencies, or in hospitals could be enhanced if these psychologists had an orientation and familiarity with the culture of these social institutions. In terms of formal training such orientation may be started by course work in significant fields. Thus, the person interested in the psychology of advertising should certainly take work related to advertising and marketing in a college of commerce; the educational psychologist should familiarize himself with work in professional education, possibly including practice teaching; similarly in other fields related work is desirable. Apart from the formal course work the student should gain a first-hand acquaintance either during an internship period or by employment in an agency related to his applied interests in which he may learn from immediate experience some of the problems. Such employment need not necessarily be as a psychologist even at a subprofessional level. In fact there is much to argue that employment as a factory hand may be valuable to the personnel psychologist, or a period of school teaching to the educational psychologist, or work as an attendant to the person in clinical psychology who is interested in dealing with the subnormal or the psychotic.

TRAINING IN PSYCHOLOGY

Professional and scientific training in psychology has for many years required work beyond the bachelor's degree. In 1917 Cattell

pointed out that 84 per cent of the APA membership held the Ph.D. degree. Continuing, he says: "Psychology is the most academic of all subjects, a larger percentage of psychologists having taken the advanced university degree than is the case in any other science. Thus in a study made several years ago I found that about 60 per cent of zoologists and of mathematicians, who in this respect come next to psychologists, have taken the degree and the percentage falls to about 10 for anatomists and pathologists" (7). The percentage of the APA membership holding the degree has declined; in 1949 Black (3) reported that only 55 per cent of a sample of one-half the names in the 1948 Directory held the Ph.D. degree. An additional 40 per cent had a master's degree.

The decrease in percentage of Ph.D.'s is very probably due to the increasing number of people being employed as psychologists in other than academic positions. The amount of training is currently a subject of considerable discussion. Darley *et al.* (8) found that of 90 persons employed as applied psychologists in Minnesota, 67 were in non-academic positions and of these only 9 had a Ph.D. degree. They say: "The real work of applied psychology, however, is being done by B.A.'s ($N = 14$) and M.A.'s ($N = 43$).". These writers argue that it is not necessary that all psychologists have a doctor's degree. The weight of official opinion is, on the contrary, that for the good of the individual and for the professional field, work to the Ph.D. degree should be considered necessary in the preparation of professional psychologists. Further, arguments have been made that the Ph.D. is a degree marking training for research and teaching and is not suitable for many non-academic positions. Here again official opinion questions the advisability of creating a specified curriculum leading to a different professional degree. It is not important to our purpose to present the various arguments on this matter. The student should realize that there are differences of opinion, but he should not decide to limit his graduate training without very cogent reasons.

Undergraduate Programs

In the ideal case a student will have decided by the end of his freshman year, or even before starting college, that he is studying to become a psychologist. Very few cases are ideal in this sense,

but there are enough students making this decision sufficiently early to make some attention to the undergraduate years worthwhile.

Interest of undergraduate students in psychology has shown a very material increase during the past twenty-five years. Fisher and Hinshaw (14) have reported on the number of junior and senior students in the College of Liberal Arts and Sciences at the University of Illinois who declared psychology as their major subject for each year since 1925. Gustav (16) has reported on the number of psychology majors among the graduating seniors at Washington Square College, New York University, for the decade 1939-1949.

TABLE 14
Trend in Undergraduate Registration in Psychology

<i>Year</i>	<i>Illinois*</i>	<i>Year</i>	<i>Illinois</i>	<i>New York University†</i>
1925	1.3	1938	5.4	—
1926	1.3	1939	5.6	3
1927	1.6	1940	5.2	5
1928	2.4	1941	5.4	7
1929	2.4	1942	7.1	6
1930	2.8	1943	11.8	7
1931	3.4	1944	13.1	4
1932	4.2	1945	14.4	8
1933	2.9	1946	15.9	9
1934	3.0	1947	18.1	10
1935	4.4	1948	16.1	11
1936	3.8	1949	16.4	13
1937	4.7	1950	16.9	—

* Per cent of juniors and seniors, College of Liberal Arts and Sciences, declaring major in psychology for full semester each year (Fisher and Hinshaw, 14). Data for 1945-1950 original.

† Per cent of graduating seniors with major in psychology, Washington Square College (Gustav, 16).

These data are shown in Table 14. In 1925 the percentage of upper-classmen at Illinois who were majoring in psychology was extremely small. By 1935 it had little more than tripled, changing from 1.3 to 4.4 per cent. There continued to be a gradual increase so that the percentage in 1945 was 14.4, and in 1950 had reached 16.9. Since the war this trend has continued. The percentage of graduating seniors majoring in psychology at N.Y.U. is smaller than the figures for Illinois, but the increasing trend is evident. Such data as these reflect the increasing importance of psychology, particularly in its applications to a wide variety of social affairs. One of the values of

this change is that a greater proportion of students have decided on a career interest in psychology at an earlier time during their college program.

It is practically impossible to specify any exact course which should be included in an undergraduate major. This is so because of the wide variety of course titles and descriptions which can be found by searching a number of different college catalogues. Sanford and Fleishman (20) analyzed the 1947-1948 catalogues of a carefully selected sample of 330 institutions of higher education. They found a total of 261 different courses, although, as might be expected, certain courses appeared in a fairly high proportion of the colleges. The ten most frequently occurring kinds of courses are

TABLE 15
Ten Most Frequently Occurring Psychology Courses
(after Sanford and Fleishman, [20])

<i>Course</i>	<i>Per Cent of Colleges</i>
Introductory.....	78.2
Educational.....	43.0
Social.....	38.5
Child.....	37.9
Abnormal.....	28.5
Applied.....	27.6
Adolescent.....	26.1
Tests and Measurements.....	22.7
Experimental.....	21.2
Mental Hygiene.....	20.9

listed in Table 15. The 2,546 individual courses listed in the sample were categorized under the 12 areas shown in Table 16. In the first column the number of differently titled courses in each category is shown; the second column indicates the percentage of the total courses listed falling into each category. The variety shown in these data gives some indication of the reason why specifying a standard program for an undergraduate major is difficult.

Unfortunately the content of courses commonly given in undergraduate work has never been agreed upon. This results in a considerable overlap of the topics treated in courses of a wide variety. This is well emphasized by Dael Wolfe (23) in his analysis of the content of textbooks most frequently used in several of the com-

TABLE 16

Distribution of Undergraduate Psychology Courses
(after Sanford and Fleishman, [20])

	<i>Number of Different Courses</i>	<i>Per Cent of Total Courses Listed</i>
Traditional-academic.....	33	12.5
Tests and measurements.....	7	4.9
Clinical-guidance.....	30	5.1
Business-industrial.....	23	5.2
Social.....	21	6.7
Educational.....	13	11.8
Child and adolescent.....	18	13.3
General and individual.....	43	14.6
Applied and miscellaneous.....	23	5.8
Introductory.....	1	10.1
Statistical, research methods and problems..	5	5.4
Others.....	44	4.6
	261	100.0

moner courses. His data are extensive and cannot be repeated here. In comparing textbooks used in elementary, educational, child, social, and applied psychology, Wolfe lists 32 topics, of which 9 are included in the textbooks for each of the 5 fields; 3 additional ones occur in 4 of the 5. Only 5 of the 32 topics occur in the textbooks of one field alone. It is argued that there is an undue amount of overlap and repetition in the material included in these common undergraduate courses. Wolfe ironically describes how after an author has completed an elementary textbook he can by judicious manipulation of his chapter content and a minimum of new writing produce a series of textbooks for use in at least 4 of the other commonest undergraduate courses.

In 1947 the APA Committee on Training in Clinical Psychology (2) outlined what it considered a desirable basic undergraduate program. They did not go into detail about courses but said that the student should "take a sufficient number of psychology courses to enable him to acquire a fair acquaintance with the content of the field of psychology, both in its general and in its laboratory aspects, but he should not be permitted to concentrate heavily in it. The main emphasis should be on courses in dynamic psychology which considers crucial human problems at a fairly rigorous scientific level. Mass titillating courses directed at the general student

body are definitely not what we have in mind here." They suggest an approximate optimum of twenty hours for a major, with additional work in biology and physical sciences, in mathematics and statistics, education, social sciences, history of culture, and languages. Although this committee was concerned with preparation for clinical psychology, minor changes in its statement would probably make it acceptable in connection with other areas of specialization. Stoke (22), in analyzing statements from nine university graduate departments concerning what they desire as undergraduate preparation, finds that quantitative and natural science work are emphasized. One of his respondents held the following as a desirable pattern, with the four items arranged in a decreasing order: first, advanced statistics would be the only absolute requirement; second, the writer would want a thorough knowledge of some one field in psychology, with this followed in third and fourth place by an orientation in theoretical systems and by experimental laboratory work.

One thing upon which there appears to be agreement is that the undergraduate major should be minimal. The APA Committee of Departments Offering Doctoral Training queried its membership in preparation for a discussion at the 1951 meetings. In an unpublished document circulated to members the committee indicated that of 48 institutions from which replies had been received, the requirements in psychology for admission to graduate work ranged from "none-specified to 31 semester-hours credit, with the median at about 18 semester-hours." In fact Stoke (22) found that only three of the nine departments he queried stipulated that they would require of any graduate students an undergraduate major in psychology. One of his respondents sums the problem up nicely: "The main defect we have found in beginning graduate students, both in the case of those from our own institution and those who come from other colleges, is a lack of breadth of educational experience. In particular they have been weak in mathematics, and both the natural and social sciences. We would prefer to have a student who has had a thorough education in this field to one who has concentrated in the single field of psychology."

Perhaps the best summary of a desirable undergraduate program would be that the student should not have more than 20 semester-hours (possibly excluding the introductory course), in which should

certainly be included statistics and laboratory experimentation. Beyond this he should so plan his program that he has at least some orientation in the biological sciences, in sociology and anthropology, and in mathematics through calculus, and, where possible, some contact with problems of education. In general we would advise the undergraduate student to work for a broad contact in a variety of fields. His concentration in psychology is better delayed until his graduate program.

Graduate Work

The details of graduate programs have varied considerably from department to department and in large measure have been determined by the interests of the major professors in the departments. The period between the two World Wars showed a continuing increase in interest in the applications of psychology, but this change did not have more than an incidental effect upon the work offered at the graduate level. Although certain departments offered greater opportunity for specialized training in applied areas, there was a basic core which emphasized work in the theoretical and experimental aspects of the science. The great impetus given to psychology, especially in its applied aspects, by many factors operating during World War II has rather changed the conditions. In particular the training of clinical psychologists, about which questions were being raised in the middle 1930's, has received considerable official attention. Arguments have been presented that professional programs at a post-bachelor level should be developed for applied fields which might lead to a professional degree other than the Ph.D. The official position of the APA is at present contrary to this proposal. Most simply stated, it is felt that the training in an experimental-theoretical approach is perhaps the strongest contribution psychologists have made or can make to problems of psychological application.

From the point of view of the student one frequently finds confusion or resistance. The person who has determined his goal to be in clinical psychology, in counseling and guidance, or in industrial psychology is frequently impatient with requirements in experimental or theoretical areas. Contrariwise, the student with a goal of teaching in "experimental psychology" objects to being required to study personality dynamics or social psychology. Except in the area

of clinical psychology no very concerted effort has been made to develop programs which departments may accept as models to follow.

In 1947 the APA Committee on Training in Clinical Psychology (2), after several years of discussion and study, published a recommended graduate training program in the clinical area which was officially adopted by the Council of the Association. This recommended program has been a standard which all departments having an interest in the training of clinicians have attempted to follow. Further, there are reasons to believe that it has had an influence beyond the clinical area. It was not narrowly conceived and, with some modification, it sets forth principles which would be effective regardless of the specialty which interests the student or the department. The program does not specify courses to be taken but outlines six areas in which the student should have work. These areas are:

1. *General Psychology.* This area includes physiological and comparative, developmental, and social psychology, and history and systems.

2. *Psychological Dynamics of Behavior.* This area is intended to include work in personality and motivational theory in psychopathology and in experimental dynamic psychology.

3. *Diagnostic Methods.* Included in this area are methods of observation and the reporting of observations, interviewing, case study methods, psychometric diagnostic methods, and a survey of clinical psychology.

4. *Therapy.* Course work in this area should include theories and methods in different systems of therapy and include attention to methods of dealing with special disabilities, with guidance and counseling, with group therapy, and so on.

5. *Research Methods.* This area is intended to include work in laboratory and statistical methods as well as training in the use of experimental attack on problems of a variety of sorts.

6. *Related Disciplines.* In addition to work in more strictly psychological fields the Committee considers desirable work in physiological sciences, in an introduction to clinical medicine, in social organization and the social pathology, and in cultural anthropology especially from the point of view of personality development.

It is evident that this program is broadly conceived and, if ade-

quately carried out, should produce in competent students a sound training. Raimy's report (19) on a Conference on Graduate Education in Clinical Psychology presents an evaluation of the views of the participants on this program, as well as other aspects of the training of clinical psychologists. For areas other than the clinical, emphases on details could be changed. For all applied fields the program would have value with perhaps greatly minimized attention to therapy and a change in the related disciplines to be included. For scientific or academic psychology there might be considerably less emphasis on areas three and four with greater attention to one and five and with again a change in the content of the related disciplines.

It is impractical for us to attempt specific suggestions as to a graduate program which a student should follow. In considerable measure this will be determined by the department in which he is registered. As general advice we cannot emphasize too strongly the importance of competence in experimental methods and in theoretical sophistication. These are available in all graduate departments. Beyond this a student's special interest should play a part in determining the department in which he does his work. From time to time articles have been published in the *American Psychologist* listing departments and indicating the areas in which they are prepared to give special training. In 1951 Helen Wolfe (24) published a list of universities indicating those which were prepared to give graduate work in nine fields of specialty—experimental, child, educational, social and personality, clinical, counseling and guidance, tests and measurements, industrial, and applied social—with a further indication of those departments having work only to the master's degree and providing a general preparation for the Ph.D. degree. (See also A 134.) That there is considerable choice available to the student is indicated in Table 17 showing the number of universities providing work leading to either a doctor's or master's degree in each of the special areas.

In the specific field of clinical psychology the APA has undertaken to investigate and approve departments. The Board of Directors of the Association (1) in 1952 published an official list of 40 institutions offering doctoral training programs in clinical psychology which had been approved and had been certified as approved to the Veterans Administration and the Public Health Service.

TABLE 17

Graduate Departments by Psychological Specialties
(from Wolfe, [24])

Field	Number of Universities Granting	
	Ph.D.	M.A.
Experimental.....	63	94
Child.....	40	66
Educational.....	30	48
Social and Personality.....	44	74
Clinical.....	52	72
Counseling.....	39	64
Tests and Measurements.....	47	83
Industrial.....	32	47
Applied Social.....	10	20
General Preparation for Ph.D.....	—	88

The list of universities published by Wolfe included 136 institutions. It would be presumptuous of us to attempt either valuation or description of the work of these universities. However, there are data available concerning the number of Ph.D. degrees granted, which indicate at least the popularity of different institutions. Bryan and Boring (6), from an analysis of 4,580 questionnaires from psychologists submitted to the Office of Psychological Personnel, present the data shown in Table 18. Of the 2,020 respondents who held the Ph.D. degree and who reported the institution which had granted it, three-quarters received their degrees from 23 universities. The relative frequency among these is indicated in the table.

TABLE 18

Universities Granting Ph.D. Degree to 2,020 Psychologists
(Source: Bryan and Boring, [6])

Columbia.....	422	Johns Hopkins.....	63
Iowa.....	187	California.....	63
Chicago.....	166	Northwestern.....	46
Harvard.....	149	Peabody.....	44
Ohio State.....	134	Illinois.....	41
Yale.....	112	Princeton.....	27
Minnesota.....	100	Indiana.....	26
New York University.....	82	Duke.....	25
Stanford.....	81	Southern California.....	24
Pennsylvania.....	68	North Carolina.....	22
Clark.....	65	Nebraska.....	20
Cornell.....	65	Others.....	562
Michigan.....	65		

VOCATIONAL OPPORTUNITIES

The impetus given to expansion of professional psychology by psychological work during World War II is evident to anyone who is close to the field. As earlier discussion has indicated, psychologists for many years found their vocational opportunities primarily in the field of college teaching. The period between the two World Wars was one of increasing non-academic use of psychologists, and this trend has been appreciably accelerated since 1945. According to Finch and Odoroff (12, 13), in 1916 only 9 per cent of members of the APA who were employed as psychologists were in positions other than teaching. By 1931 this had increased to 27 per cent, by 1940 to 39 per cent, and in 1948 Black (3) indicated that 54 per cent of APA members were employed in non-academic positions. This trend does not in any way minimize the importance of teachers in psychology. Without them training for the applied vocational areas would be impossible. In fact, there appears still to be a strong tradition in favor of college teaching even for many of the people whose interests are in applied areas.

The increasing use of psychologists in a wide variety of non-academic areas has magnified the importance of the degree of training. In the preceding section we have discussed the advantages of graduate work leading to the Ph.D. degree. However, such studies as those of Black (3) and Darley *et al.* (8) indicate that a large number of positions are available at what might be considered a technician or subprofessional level. Such positions usually require not more than a master's degree. The question whether or not such subprofessional positions and training for them should be encouraged has not been settled. Therefore, it seems improper for us to comment in this book. It seems most reasonable to believe that the question will probably be settled by the nature of social demands on the profession but that it will not be settled within the next few years.

The Variety of Vocational Specialties

The increasing amount of non-academic vocational opportunities in psychology is spread over a variety of areas. Prominent among these are, of course, clinical work, work as psychologists in schools and other educational organizations, guidance and personnel work,

and work in various phases of business and industry, as well as in private or clinical consulting practice. Persons have been engaged in these areas in increasing numbers for many years. In the last decade or so new applied areas have developed. Opinion and attitude surveys have attracted many individuals. This work is related both to business marketing interests and to applied social psychology. The field of engineering psychology—that is, the application of psychological data of perception and response to problems of engineering design—started particularly in connection with aviation during World War II and is increasing in importance continuously. Other fields of application less well known are illustrated by Dr. Alice Bryan's work (5) in connection with the Columbia Library School, Forbes's studies (15) in traffic engineering, Lark-Horovitz and Keith's work (17) in art museums, the Brelands' work (4) in animal training, and others. One might generalize by saying that wherever there are practical problems of understanding, interpreting, guiding, or controlling behavior there is a possible value in the contribution the well-trained psychologist can make.

In a somewhat more formal fashion there has been one attempt to describe specific jobs actually held by psychologists in appreciable numbers. Shartle (21) has published job descriptions for 28 occupations, based on some 250 descriptions submitted by individual psychologists. In the original publication titles and synonyms, duties, qualifications, and prospects for employment are given for the following 28 occupations:

1. Psychologist, college teaching
2. Counselor, college
3. Educational research, college
4. Psychologist, public schools
5. Psychologist, clinical general
6. Psychologist, child guidance clinic (state agency)
7. Psychologist, feeble-minded institutions
8. Psychologist, hospital for insane
9. Psychologist, juvenile correctional institutions
10. Psychologist, penal institution
11. Court psychologist
12. Research psychologist, hospital (psychophysiological)
13. Psychologist, hospital (general and neurological)
14. Psychologist, State Civil Service, general
15. Director of psychology, state agency
16. Personnel examiner and technician, civil service or merit

17. Psychologist for physically handicapped
18. Personnel psychologist, industry or industrial consulting firm
19. Personnel technician, industry
20. Public opinion survey psychologist
21. Consulting psychologist
22. Psychometrist
23. Research psychologist, general
24. Employment interviewer
25. Employment counselor
26. Occupational analyst
27. Vocational advisor, VA
28. Vocational counselor, community agency

A small pamphlet of occupational information concerning careers in psychology has been published by Dudycha (11). He discusses occupational opportunities, qualifications, and training for work in teaching, counseling, clinical work, business and industry, and government service. The amount of interest in careers in psychology is indicated by the abundance of the literature. Dudycha (9) in 1947 published an annotated bibliography of 157 references concerned with a wide variety of problems dealing with psychology as a profession. Only 21 of these references had been published earlier than 1940. In the following year (10) the same author had 54 references in a second paper. These bibliographic papers are an important starting point for studies of such professional problems as preparation for teaching, psychological counseling, and work in the clinical field, in business and industry, and in government service, as well as for questions of internships and certification.

Placement

Although the general trend is toward an increase in the number of positions available to psychologists and although there appears to be no unemployment among psychologists in these mid-century years, the student completing his work is always faced with the necessity of finding a position.

It has long been a tradition in most academic fields that the machinery for securing positions, especially in college teaching, is through personal contacts of members of the profession. For many years almost the only procedure followed when a new member for a psychology department was sought was to request the names of candidates from colleagues in other psychology departments. This

procedure worked reasonably well, but with an increasing number of jobs and an increasing number of persons it has become cumbersome and inadequate to fill all the needs. This is not to say, however, that the personal contacts of senior members of different departments are not still a significant factor in job placement on university faculties.

A somewhat more formal method is the registration of names and positions with either non-profit or commercial agencies. Practically all universities maintain a placement service for their graduates. Registration with such a placement service requires the completion of an information blank and the securing of letters of recommendation, either by the registrant or directly by the bureau. In either case the information on the registration blank, sometimes a transcript of academic record, and copies of letters of recommendation are duplicated and arranged as a dossier on the registrant. Such collections of documents are freely made available to possible employers. If a position is accepted, it is at least a courtesy to inform the placement bureau that your documents should be removed from the active file. Usually these bureaus retain information unless specifically asked to remove it. And it is to the advantage of the registrant to keep this file up-to-date by the submission of records of employment and additional letters where they seem pertinent. In the case of their own alumni, colleges and placement bureaus make no charge to either the employer or the registrant.

Operating in much the same manner as the college placement bureau are the commercial teacher agencies and other professional placement agencies. They collect information about the applicant and furnish prospective employers with a dossier. The commercial agencies charge the applicant for their services, frequently requiring a registration fee and a percentage of the first year's salary. Commercial placement agencies play an important function. The modest registration fee is a good investment because these placement agencies usually have a close contact with openings throughout the nation or the large region in which they concentrate their efforts.

Because neither the university placement bureaus nor commercial agencies have specialized in the placement of psychologists, the APA in 1945 established in the office of the Executive Secretary a placement service which specializes in both academic and non-

academic jobs for psychologists. The procedure in this placement bureau is much the same as that found in the other types. The APA placement bureau usually establishes an office near the registration desk at the annual meetings; here prospective employers may examine the credentials of registrants and the registrant may learn about prospective openings. In addition to this the placement bureau has published monthly since May 1952 the *APA Employment Bulletin*, which "contains notices of vacancies, information about programs employing numbers of psychologists, and situation-wanted notices of members of APA." The *Bulletin* is sent gratis to graduate departments of psychology and upon request to heads of organizations employing ten or more psychologists. Members of the APA may subscribe at the rate of one dollar for six months. Also, members of the APA may have a situation-wanted notice published for one dollar per insertion. The APA Central Office supplies special forms to both employers and to members for registration in either the job-opening or job-wanted category. The placement service has become one of the important activities of the Association. To judge from its record of performance, it is being found very useful both to employers and to individual psychologists.

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CHAPTER 11

Psychological Organizations

One characteristic of American science is the very large number of associations and societies into which individual scientists have grouped themselves. This is as true for psychologists as it is for other scientific or professional groups. Psychological associations perform very valuable functions in connection with the integration of the scientific and the professional field. As we shall discuss in this chapter, these associations may be international, national, regional, or local in geographic scope, and they may be general or limited to a narrow subject in their content interest. Regardless of their nature, associations provide all or some of the following: (a) identification with professional colleagues, (b) opportunity for professional and personal intercourse in annual meetings, (c) support of publication activities, (d) provision of services to members, (e) a means of promoting development and co-ordination of the discipline, and (f) promotion of the professional group as a whole and the maintenance of relations with other professional and scientific groups.

The value of membership in any psychological association for an individual psychologist must be determined by that individual himself. However, the large number of professional psychologists who belong to one or more of the existing organizations would appear to support an argument that such membership is of value. In those organizations which have carefully defined standards of membership, affiliation has a significance in identifying one as an accepted colleague. Participation in the professional and social aspects of association meetings enables one to meet and develop personal acquaintance with psychologists who might otherwise be known only as names in the literature. We would feel it good advice to

encourage graduate students who are beginning their professional careers to become affiliated insofar as membership requirements allow with one or more of the psychological associations.

THE AMERICAN PSYCHOLOGICAL ASSOCIATION

The major organization of psychologists in this country is the American Psychological Association, which, according to its by-laws, has as its objective "to advance psychology as a science, as a profession, and as a means of promoting human welfare." The APA was founded in 1892 with a membership of 32. Its growth since then has been discussed in some detail in Chapter 2 and need not be repeated here. As of January 1, 1953, the membership was 11,200. The history of the Association to 1940 has been presented in detail by Fernberger (7, 8). Perhaps the major change in the nature of the Association took place in the middle 1940's. Following World War I the development of psychology in its application to a variety of human affairs accelerated until by the middle 1930's a major proportion, if not a majority, of the membership found that their primary interest lay in clinical, industrial, educational, social, or other special areas having an applied emphasis rather than in the so-called experimental psychology of the laboratory alone. Except for the provision of a section on clinical psychology as early as 1921, the Association had not shown a great deal of interest in the professional aspirations of its membership. The feeling of concern of many psychologists toward the Association's attitude found expression in 1937 in the organization of the American Association for Applied Psychology. In the two preceding years, two other groups had started associations for special fields to which they felt the APA was unresponsive. These resulted in the formation of the Psychometric Society and the Society for the Psychological Study of Social Issues. These two organizations still continue as specialty associations.

The AAAP quickly became a major organization, with over 700 members. During the period of world unrest of 1939 and 1940 and the subsequent entry of the United States into World War II, a weakness in American psychology in its conflicting organizations was apparent to many. Under the auspices of the National Research Council there was organized in 1940 an Emergency Committee in Psychology, on which the national psychological societies were rep-

resented and which spoke for American psychology in connection with emergency and war activities (5). A number of thoughtful psychologists recognized that the profession would have a significant expansion and increased social obligations following the war. With two major national organizations the profession was weakened in its efforts to meet the demands. With the co-operation of the officers and governing boards of the several associations, an Intersociety Constitutional Committee was formed and held its first meeting in 1943. The discussions of this Committee and its recommendations, which were concurred in by the organizations involved, resulted in 1945 in the dissolving of the American Association for Applied Psychology, and in a fundamental reorganization of the structure of the American Psychological Association with a reorientation of its objectives. It is this reorganized APA which is the subject of our discussion.

Divisional Organization. In the reorganization of the APA the divisional structure, which had characterized the AAAP, was established in order to provide recognition for specialized interests of psychologists. In the original by-laws there were provided 19 charter divisions. Subsequently consolidation of divisions and the establishment of new ones resulted in the following list of 17 in 1952:

- Division of General Psychology
- Division on the Teaching of Psychology
- Division of Experimental Psychology
- Division on Evaluation and Measurement
- Division on Childhood and Adolescence
- Division of Personality and Social Psychology
- The Society for the Psychological Study of Social Issues—a Division of the American Psychological Association
- Division on Esthetics
- Division of Clinical and Abnormal Psychology
- Division of Consulting Psychology
- Division of Industrial and Business Psychology
- Division of Educational Psychology
- Division of School Psychologists
- Division of Counseling and Guidance Psychologists
- Division of Psychologists in Public Service
- Division of Military Psychology
- Division on Maturity and Old Age

In many respects the Divisions are organized units, having their own officers and, within the framework of the Association, carrying

on a number of functions related to their special interests. However, the number of Divisions and the fact that some are organized on a subject basis and others on the basis of professional field result in considerable complexity. In his annual report as Executive Secretary, Dael Wolfe (16) in 1949 analyzed the divisional structure and proposed a reduction to three professional Divisions and four subject-matter Divisions. More highly specialized interests of members, he proposed, could be taken care of by less formal groupings. Such less formal sections could be responsible for sessions at the annual meetings and members could meet to discuss problems of common interest but they need not maintain a formal existence of permanence beyond the active interest of their members. Although Dr. Wolfe's report was favorably commented upon, it has not resulted in changes such as he suggested.

Each Division has its own officers, including representatives to the APA Council of Representatives, and each has the opportunity of accepting responsibility for one or more sessions at the annual meeting of the Association. A number of the Divisions publish newsletters to keep their members informed of activities of the Division that are distinct from those of the Association. Each Division also determines its own requirements for membership. Such requirements cannot be less rigorous than those of the Association but may be more so. In addition the Division may elect Division affiliates, who are non-psychologists interested in the special field of the Division but not able to meet Association membership requirements. It is evident from these activities that Divisions have a considerable degree of autonomy.

Membership and Fees. The two major classes of membership in the APA are Associate and Fellow. Under present practice all new members are elected first to the Associate class. Here the applicant must meet one of three requirements: (a) have a doctor's degree from a recognized graduate school based upon a psychological dissertation; or (b) have two years of graduate work in psychology and be devoting his full time to work or to graduate study primarily psychological in nature; or (c) have one year of graduate study plus one year of professional work in psychology and be devoting his full time to work or graduate study primarily psychological in character. Fellows are nominated from among Associate members by one of the Divisions and are elected by the Council of Representa-

tives. Fellows must have a doctor's degree, have at least five years of acceptable professional experience beyond the degree, and be primarily engaged in the advancement of psychology as a science and as a profession.

Fellows or Associates who have held membership for 20 years and who have reached 65 years of age may be made life members upon their request. In addition to regular memberships, the Association's by-laws provide for a class of Foreign Affiliates, which is open to psychologists residing in countries other than the United States and Canada who are members of the psychological association of their own country or, if there is no such association, who "present evidence of appropriate qualifications."

Undergraduate or graduate students who do not meet minimal qualifications for Associate membership may become members of the Student Journal Group. The affairs of this Group are the responsibility of a Committee on Student Activities. Members of the Student Journal Group are not members of the Association and they have privileges only as granted by the Council of Representatives. They may, of course, attend the professional meetings of the Association; they receive subscriptions to *Psychological Abstracts*, *The American Psychologist*, and the *Directory*; and they may subscribe to the other APA journals at special rates.

Each class of membership has annual dues which may be changed from time to time by action of the Council of Representatives. In 1953 the fees were \$12.50 for the first five years after election, and \$17.50 thereafter for both Fellows and Associates. The dues include membership in one Division; for membership in Divisions beyond the first there is an additional fee of \$1.00 for each. Each Division may, by vote of its own membership, levy special assessments; some Divisions have done this to meet special expenses. Members all receive *The American Psychologist*, *Psychological Abstracts*, the *Psychological Bulletin*, and the *Directory of the Association* as part of their membership fee. Members may also secure reduced subscription rates for other APA journals.

Government of the Association. Because of the large size of the membership of the Association its government rests with a Council of Representatives and a Board of Directors rather than directly with the membership. The Council of Representatives is the legislative head of the Association. It consists of the five elected officers

of the Association (i.e., President, President-elect, Past President, Recording Secretary, and Treasurer), plus representatives from the Divisions (with a minimum of two for a divisional membership of 300 or fewer and additional representatives for additional members according to a graduated scale), plus representatives from the Conference of State Psychological Associations. The Council, with a membership larger than 75, has full authority over the affairs and funds of the Association. At its regular business meeting, held at the time and place of the annual convention of the Association, and at special meetings which may be called by the Board of Directors, the Council of Representatives legislates for the Association. It has been a practice to hold each year an open meeting of the Association during the annual convention at which actions of the Council are reported to the membership.

The Board of Directors consists of the five elected officers of the Association, the Executive Secretary (*ex officio*), and six others elected by the Council of Representatives from its own membership. The Board is the administrative agent of the Council. Meetings of the Board are held semi-annually. It has power of action between meetings of the Council, but actions are subject to the Council's approval.

The functions and activities of the APA may be conveniently divided into four groups: committees, annual meeting, publications, and the Executive Secretary's office.

Committees. Certain continuing functions of the Association and a varying number of special problems are dealt with first in committees. On the basis of their investigations and deliberations committees make annual reports and in addition may recommend specific actions for consideration by the Council of Representatives. For certain continuing problems the by-laws provide for ten standing committees, viz., the Policy and Planning Board, the Publication Board, the Council of Editors, and committees on Membership, Finance, Convention Program, Scientific and Professional Ethics and Conduct, Elections, Student Activities, and Public Relations. The functions of these committees are evident from their titles except for the Policy and Planning Board. This is a major body charged with a continuing review of the Association and its activities in relation to the changes in the psychological profession. It has recommended changes in the by-laws and in other activities

of the Association which have been approved by the Council and, where necessary, submitted to the membership for vote.

In addition to the standing committees, special committees may be appointed by the Council or the Board of Directors to consider special problems which arise from time to time. The terms of special committees are not definite; their work may be completed within a year or they may continue for several years. Among the problems for which special committees have been appointed are precautions in animal experimentation, audiovisual aids, the relations of psychology to such fields as psychiatry and social work, and training, including that at the doctoral level in clinical psychology, and for the predoctoral level.

Annual Meeting. The Association has held an annual convention each year since 1892, although between 1943 and 1945 the meetings were of the governing bodies only at the request of the Office of Defense Transportation. The programs of the annual meetings have always included sessions for the reporting of research work and business sessions of the Association as a whole and of its Divisions or other units, and in more recent years have included invitational general addresses and symposia on current professional problems and psychological topics. In addition to their more formal aspects the annual meetings give opportunity for renewing personal friendships and informal contacts between psychologists. The meetings, which have been held for a number of years during the first week of September, are open to graduate students and others interested as well as to members.

Publications. From a financial point of view the major activity of the Association is its program of publications. As of 1952 the Association published the following ten journals, as well as the annual *Directory*:

The American Psychologist
Journal of Abnormal and Social Psychology
Journal of Applied Psychology
Journal of Comparative and Physiological Psychology
Journal of Consulting Psychology
Journal of Experimental Psychology
Psychological Abstracts
Psychological Bulletin
Psychological Monographs
Psychological Review

Executive Secretary's Office. One of the major results of the reorganization of the Association following World War II was the establishment of a central office in charge of an appointed Executive Secretary. In this office all business functions of the Association and of its publishing activities are carried on. The formal activities required in keeping up membership lists, in co-ordinating activities of the Divisions and committees, and in similar types of Association administration are done. The Executive Secretary has also acted as a representative of the Association in meetings with government agencies and with other associations in dealing with problems in which psychology has a part. Finally, there has been established in the central office a placement service which makes possible the registration of members interested in positions and enables potential employers to secure information concerning possible applicants.

Affiliation with Other Organizations. The wide variety of interests represented in the APA and the cross-discipline interests of psychologists as shown in the literature and by individual membership in other societies make inevitable official relations with other organizations. At present the APA has direct representation in 13 national and international bodies as listed:

- American Association for the Advancement of Science
- American Documentation Institute
- American Standards Association (Sectional Committee for Standardization of Optics)
- Committee on Mathematical Training of Social Scientists
- Groupement International pour la Coordination de la Psychiatrie et des Méthodes Psychologiques
- International Union of Scientific Psychology
- Inter-Society Color Council
- National Council for Mobilization of Education
- National Research Council
- National Society for Crippled Children and Adults
- Social Science Research Council
- War Claims Commission's Special Advisory Committee
- World Federation for Mental Health

REGIONAL ASSOCIATIONS

As the American Psychological Association grew larger, psychologists in several regions of the United States felt the desirability of organizing regional associations whose meetings in general would be easier to attend both because of lesser distance and because of

their smaller size. Most of these associations were started in the 1920's. In general their purposes are similar to those of the APA with greater emphasis on annual meetings devoted to research papers and with less interest in the professional activities. The annual meetings are usually held in the spring; the exact dates are included in the list of convention dates regularly published in *The American Psychologist*. All of these associations are affiliated with the APA, although some of their members may not belong to the national Association. The five regional associations are the Eastern, Midwestern, Rocky Mountain, Southern, and Western.

Eastern Psychological Association

Around 1900 there was established in New York City a somewhat informal group known as the New York Branch of the American Psychological Association. This group also had an informal connection with the Section on Anthropology and Psychology of the New York Academy of Science. James McKeen Cattell was primarily responsible for its establishment. In its informality there were no regular officers except a secretary and treasurer and no permanent records were maintained. Apparently this group met two or three times each year between 1900 and 1929. In the latter year there were discussions concerning a more formal organization, and in the spring of 1930 a formal meeting was held under the honorary presidency of R. S. Woodworth. The following year membership in this group was extended to members of the APA living within an approximate 100-mile radius of New York City. During the next five years there were requests for admission from persons beyond this area; in 1935 membership was extended to psychologists at Brown University; and at the seventh meeting, in 1936, the name was officially changed to the Eastern Branch of the American Psychological Association and its area was extended. Finally, in 1938 the name was changed to the Eastern Psychological Association (9).

Membership is open to Associates or Fellows of the American Psychological Association or to persons who have had one full year of graduate study in psychology. The geographic area covered includes the eastern seaboard from New England to Virginia plus the state of West Virginia and the Canadian Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island.

Members moving from these states are considered as having resigned, although they may retain membership upon their request by specific action of the Association's Board of Directors. In 1951 the membership was approximately 1,750.

Midwestern Psychological Association

An informal organizational meeting which resulted in the founding of the Midwestern Psychological Association was held at Northwestern University, Evanston, in 1926. The first official meeting was held in 1927 on the Chicago campus of Northwestern University. Although this was the first regular meeting, the proceedings of the Association apparently have included the organizational meeting as its first, since the proceedings of the Sixth Annual Meeting were published in 1931 by H. B. English, Secretary. Membership is open to any Associate or Fellow of the American Psychological Association upon application and payment of dues. Non-members of APA are admitted if they are engaged in psychological activity and are sponsored by a member of the MPA. The geographic area extends north of the Ohio and Missouri Rivers from Ohio westward to Nebraska and the Dakotas. Pennsylvania, Kentucky, Kansas, and Oklahoma, just beyond the borders of this region, are represented by many members. Actually there are no firm geographic restrictions. A personal communication from David A. Grant, Secretary-Treasurer, says, "The geographic area covered by the membership of the MPA extends from Addis Ababa in Ethiopia to Los Angeles, California and from Florida to Connecticut." Members outside of the midwestern states are usually persons who were once within the area but who have moved from it and who have retained their membership. In 1951 there was a membership of about 1,000; those in attendance at annual meetings exceeded this by several hundred.

Rocky Mountain Branch of the American Psychological Association

According to the first published proceedings of this Association, written by the Secretary, G. T. Avery, at a meeting of the Colorado-Wyoming Academy of Science held in November 1932, members of the psychology section of the Academy and of the Colorado Branch of the APA took the following action: "... vote to unite the psy-

chology section of the Academy with the Colorado Branch of the American Psychological Association under the name of Rocky Mountain Branch of the American Psychological Association" (2). In a personal communication Lawrence S. Rogers, Secretary-Treasurer of the Branch, says the organization was founded in 1930. Presumably this was the date of beginning the Colorado Branch, which two years later became a part of a larger organization. Membership in the Branch is open to Fellows, Associates, or life members of the APA and affiliateship is open to interested persons who reside in the Rocky Mountain region. This region is defined as including Colorado, Wyoming, Utah, Idaho, and Montana. In 1951 there were approximately 100 members.

The Southern Society for Philosophy and Psychology

On the initiative of Edward Franklin Buckner, who was then professor of philosophy and education at the University of Alabama, a preliminary conference to discuss the organization of an association of people engaged in philosophy and psychology in the southern states met on February 23, 1904, at a meeting of the Department of Superintendents of the National Education Association, which was being held at Atlanta, Georgia. Those in attendance at this preliminary conference decided to found an association and to hold its first annual meeting the following December. This first meeting was held on December 27, 1904, with 36 charter members. J. Mark Baldwin was elected President and held this position until 1907. This is the oldest of the regional societies and it has continued to unite philosophy and psychology in its membership and on its programs. Membership requires that the applicant be engaged professionally in philosophy and/or psychology. Associate members must have not fewer than two years in a program of graduate studies in one or both of these fields. In general the membership is drawn from Maryland and states south on the Atlantic seaboard and extending west to the Mississippi with Texas also being included. This large region of the southern states may be thought of as the geographic area covered, but there are members throughout widely scattered areas of the United States. In 1951 the membership was approximately 390. J. B. Miner has published two histories of this Society (11, 12).

Western Psychological Association

The Western Psychological Association was founded at a meeting of psychologists on August 4 and 5, 1921, during a meeting of the Pacific Division of the American Association for the Advancement of Science being held at the University of California at Berkeley. Brant Clark, the Secretary in 1951, says in a personal letter, "The Western Psychological Association really has only one purpose, the annual meeting at which papers are read." He further points out that the Association is informally organized and has no constitution or official by-laws. Its first ten meetings were held within the state of California, but in June 1931 the first meeting outside of this state was held at the University of Oregon at Eugene.

Membership is open to all members of the APA upon the payment of dues. In the past non-APA members have been accepted but this was apparently not the policy in 1951. The membership is estimated to be approximately 450. The geographic region covered includes the three Pacific Coast states, Hawaii, British Columbia, and the states of Idaho, Arizona, New Mexico, and Utah.

STATE AND LOCAL ASSOCIATIONS

As has been mentioned in the discussion of the Eastern Psychological Association, its origins are found in a local society limited at first to the New York metropolitan area. This is the earliest of societies covering a single state or lesser geographical area. During the 1930's there was a considerable increase in the number of state associations founded. In considerable measure this movement was related to the increased attention to professional problems of psychologists which led, among other things, to the organization of the American Association for Applied Psychology. This Association made explicit provision for the affiliation of state societies in the Conference of State Psychological Associations. This administrative function became a part of the reorganized APA in 1946. Many of the first state associations were more or less limited to applied psychology and one of their most important activities had to do with problems of certification or licensing, which of course would have to be done at the state level. The number of state associations

has continued to increase until in 1952 there were 39 such associations affiliated with the APA. These affiliated associations were:

Alabama Psychological Association
Arizona Psychological Association
Arkansas Psychological Association
California State Psychological Association
Colorado Psychological Association
Connecticut State Psychological Society
Delaware Psychological Association
District of Columbia Psychological Association
Florida Psychological Association
Georgia Psychological Association
Hawaii Psychological Association
Illinois Psychological Association
Indiana Psychological Association
Iowa Psychological Association
Kansas Psychological Association
Kentucky Psychological Association
Louisiana Psychological Association
Maine Psychological Association
Massachusetts Psychological Association
Michigan Psychological Association
Minnesota Psychological Association
Missouri Psychological Association
New Jersey Psychological Association
New York State Psychological Association
North Carolina Psychological Association
Ohio Psychological Association
Oklahoma State Psychological Association
Ontario Psychological Association
Oregon Psychological Association
Pennsylvania Psychological Association
Psychological Association of the Province of Quebec
Tennessee Psychological Association
Texas Psychological Association
Vermont Psychological Association
Psychological Section of the Virginia Academy of Science
State Psychological Association of Washington
Utah Psychological Association
West Virginia Psychological Association
Wisconsin Psychological Association

Membership in the state associations varies widely. Members of the APA are eligible for membership in all state societies. A number will accept as members persons engaged or interested in psycho-

logical work who would not be eligible for membership in the APA. At the present time all state associations represent all psychologists in their geographical region, both those in academic work and those in applied fields. The state associations usually hold meetings at least annually, sometimes with formal papers but perhaps more commonly with seminar or symposium types of programs. Because they can give the graduate student an early experience in meeting with other psychologists, it is strongly urged that graduate students affiliate themselves with the state or local association immediately available to them.

For the same reasons of immediate interests which led to the formation of regional and state associations there have been established organizations of varying size and formality in geographic areas smaller than a state. Since local associations are not affiliated directly with the APA, there appears to be no formal or complete list of them available. The Upper New York Psychological Association, including psychologists outside of New York City, and the Metropolitan New York Psychological Association, for psychologists in New York City and its metropolitan environs, are well-known examples of associations based on special geographic factors. The Chicago Psychology Club serves a function for psychology in the Chicago metropolitan area. The Connecticut Valley Psychological Association and the Southern California Psychological Association, like that of Upper New York, cover more than a metropolitan area. City associations and clubs have been noted for Cleveland, Cincinnati, and Youngstown, Ohio; Rochester, New York; Detroit, Michigan; San Diego, California; Seattle, Washington; and Philadelphia, Pennsylvania. There are probably more than these, and the future will certainly find more local organizations as the number of psychologists increases.

INTERNATIONAL ORGANIZATIONS

The International Congress of Psychology

Inasmuch as psychology is not only national in its interests, association between psychologists in various countries of the world is highly desirable. The value of such association was recognized very early, and the first international congress was proposed by Ochorowicz and was held under the presidency of Charcot in Paris in

1889. Since that time there have been 13 international congresses held as follows:

<i>Date</i>	<i>Place</i>	<i>Number</i>	<i>President</i>	<i>Secretary</i>
1. 1889	Paris	200	Charcot	C. Richet
2. 1892	London	300	Sidgwick	F. W. H. Myers
3. 1896	Munich	600	Stumpf	Schrenk-Notzing
4. 1900	Paris	475	Ribot	Janet
5. 1905	Rome	475	Sergi	de Sanctis
6. 1909	Geneva	600	Flournoy	Claparède
7. 1923	Oxford	240	C. S. Myers	W. Brown
8. 1926	Groningen	240	Heymans	Roels
9. 1929	New Haven	826	Cattell	Boring
10. 1932	Copenhagen	200	Rubin	Claparède
11. 1937	Paris	550	Piéron	Claparède
12. 1948	Edinburgh	658	Drever	Thomson
13. 1951	Stockholm	666	Katz	Langfeld

There has been no exact period between meetings, although three to five years is most frequent. The World Wars I and II interfered with these congresses and therefore there have been certain gaps. Continuity between meetings is provided by an International Committee, which has the responsibility for organizing the next congress. Membership in each international congress is available to psychologists on the payment of a membership or registration fee. Attendance is, of course, highly valuable, but membership includes the cost of the proceedings whether the member has been able to attend the conference or not.

Association Internationale de Psychotechnique

International conferences on applied psychology have been held at irregular intervals for thirty years. The first conference resulted from the suggestion and work of Edouard Claparède in arranging for an "International Conference on Psychology as applied to Vocational Guidance." According to Piéron's history (13), this conference met in Geneva in September 1920. The conferences thus far held, with date, place, and president, are as follows:

	<i>Date</i>	<i>Place</i>	<i>President</i>
1.	1920	Geneva	Claparède
2.	1921	Barcelona	Claparède
3.	1922	Milan	Ferrari

	<i>Date</i>	<i>Place</i>	<i>President</i>
4.	1927	Paris	Toulouse
5.	1928	Utrecht	Roels
6.	1930	Barcelona	Madariaga & Mira
7.	1931	Moscow	Spilrein
8.	1934	Prague	Seracky
9.	1949	Berne	Piéron
10.	1951	Gothenburg	Elmgren

At the fourth conference, in 1927, the Association Internationale de Psychotechnique was officially organized. Following this year, the meetings of the Association have been the international conferences. The Spanish Civil War and World War II interfered with plans so that there was a 15-year interval between the eighth and ninth meetings. The eleventh meeting was planned for Paris in 1953. Active membership in the Association may be held by individuals who are working in the field of applied psychology and who are sponsored by two members (1). The *Bulletin* of the Association was started in 1952, and is printed in the journal *Le Travail Humain* and as a separate series.

International Union of Scientific Psychology

World War II interfered with the activities of psychological associations in all parts of the world. Since the war these associations have been reactivated and are starting to carry on many of their prewar programs. An increasing emphasis on international co-operation, resulting in considerable measure from the work of UNESCO, has resulted in the formation of international scientific unions in a number of fields. At the 13th International Congress of Psychology at Stockholm in 1951, the International Union of Scientific Psychology was organized and a constitution adopted. Membership in the Union is open to national psychological societies of any country. Financial support of the Union will be from membership fees, and subsidies from governments or private organizations.

The objectives of the Union are:

- (1) To contribute to the development of intellectual interchange and scientific relationships among psychologists of different countries and in particular to the organization of general or specialized congresses of specific topics which are yet to be determined.
- (2) To contribute to psychological documentation by means of

- an international exchange of publications, books, magazines, films, and bibliographies.
- (3) To help students of different countries go to foreign universities, laboratories, and libraries.
 - (4) To promote the interchange of students and of young investigators.

SPECIAL-PURPOSE ASSOCIATIONS

Several associations have been organized for special purposes, usually to meet the needs of special interests. Brief statements concerning some of these are given in this section.

Society of Experimental Psychologists

The Society of Experimental Psychologists has a unique history. Its origins are traced back to an informal meeting held at the invitation of Titchener in 1904. From that time until his death in 1927, small, informal meetings were held on the invitation of various psychological laboratories in the East. It is evident from Boring's account (4) that these early meetings were pretty thoroughly dominated by Titchener, both concerning the laboratories to which invitations were sent and concerning the kinds of topics discussed. During this period experimental psychology was defined as "generalized, human, adult, normal, experimental psychology."

Following Titchener's death in the summer of 1927, a final meeting of the unorganized group was held at Yale University with Raymond Dodge as host. At this meeting Titchener's loss was felt and there was discussion whether the informal meetings should be continued. The result of the discussions led to the formation of the Society of Experimental Psychologists with an increased degree of formality—at least to the extent of having officers and by-laws.

This new organization has as its objective the advancement of psychology by the holding of informal conferences on experimental methodology. Membership, which is by election, is limited to 50. To be considered, candidates must have given evidence of superior experimental work. The definition of experimental psychology has, however, been broadened from that in effect during Titchener's time. Because of its high membership standards and the small number of members permitted, election to the Society of Experimental Psychologists is considered a distinct honor. Its membership role,

past and present, includes the foremost experimentalists of the first half of the present century.

Psi Chi: National Honorary Society in Psychology

At the 1928 meeting of the Midwestern Psychological Association a local psychology fraternity, Beta Chi Sigma, at the University of Kansas, called a meeting of representatives from other local psychology groups to discuss the possibility of a national honor society. Following the discussion, delegates formed a National Graduate Council for a Psychology Fraternity, which met and adopted a constitution at the Midwestern Psychological Association meetings in May of 1929. The first annual meeting of the society was held during the International Congress of Psychology at New Haven in September 1929. Ten local organizations signed the constitution at that meeting; together with nine additional groups that signed before December 31, 1929, they constituted the charter chapters. According to the constitution, the purpose "of this organization shall be primarily to advance the science of psychology; and secondly to encourage, stimulate and maintain scholarship of the individual members in all academic fields, particularly in psychology" (14). Active membership requires the completion of eight semester-hours of psychology in a major or minor program with the quality of work being in the upper third in psychology and the upper half in all other subjects. Election must be by three-quarter vote of those present at a regular meeting of the chapter. In essence the National Society is a federation of local chapters. According to the 1949-1950 *Handbook* there were 73 chapters with nearly 5,000 members and 10,000 alumni.

Psychometric Society

In 1935 a group of psychologists interested in psychological measurements formed a society, the purpose of which, as stated in its constitution, "is to promote the development of psychology as a quantitative rational science. This concept of quantification involves the formulation of hypotheses in mathematical form, their development into a consistent quantitative psychological theory, and quantitative tests of the agreement between theory and experimental data" (15). Membership is open to persons who are interested in the purposes of the Society as described and who, from their train-

ing and experience, give evidence of their ability to contribute to these objectives. Provision is made for student membership upon certification by a faculty member or the registrar of his college that he is studying for professional development in line with the Society's objectives. Such student membership may not be held for more than three years. The Society holds annual meetings and publishes the journal *Psychometrika*. In 1951 its membership was approximately 400. Dunlap (6) has summarized the early history of the Society.

The Society for the Psychological Study of Social Issues

In 1936 a group of psychologists interested in the relation of psychology to social problems founded the Society for the Psychological Study of Social Issues, commonly known as the SPSSI. Its statement of basic objectives reads: ". . . to achieve greater effectiveness and freedom for psychology in its efforts to make society intelligible, to advance scientific knowledge regarding social change and other social processes, and to encourage the application of the findings of psychology to the problems of society. This Society shall be a non-profit body for the promotion and protection, by any means decided upon by its membership, of psychological research on significant theoretical and practical questions of social life, even when such topics are controversial in character."

In 1951 its membership of approximately 1,000 included sociologists, anthropologists, psychiatrists, political scientists, social workers, and people in other professions as well as psychologists. It is affiliated with the APA and is the one independent organization which also has chosen to accept a status as a Division of the APA. The Society has been active in publication, having published the *Journal of Social Issues* since 1945 and several yearbooks on special topics, with others in preparation. Membership is open not only to psychologists but to scientists in related fields and research-minded practitioners. Fellows and associates of the APA are automatically eligible for membership.

International Council of Women Psychologists

As a means of making their service more readily available in war work a group of women psychologists organized the National Council of Women Psychologists in 1941 and shortly had 261 members. After the end of World War II the organization voted to reorganize

as the International Council with the purpose of promoting "psychology as a science and as a profession throughout the world, particularly with respect to the contribution of women." There are three classes of members: Fellows, Associates, and Professional Affiliates. The first two have the same standards as those of the APA; the third provides for the affiliation of professional women who cannot meet the specific psychological qualifications.

Committees of the Council have been active on a number of projects, with particular emphasis on ones with international aspects. Annual meetings are held concurrently with those of the APA. The ICWP also publishes a quarterly *Newsletter*. There were 381 members listed in the 1951 handbook (10), of whom 30 lived outside the continental limits of the United States.

PROFESSIONAL SOCIETIES OTHER THAN PSYCHOLOGICAL

The wide interests of psychologists and the myriad contacts of psychology with other scientific and professional fields result in membership in associations not primarily psychological in purpose. A number of honorary or recognition societies include psychologists among those eligible to membership. Phi Beta Kappa and Phi Kappa Phi for general scholarship, Sigma Xi for science, and Phi Delta Kappa in education are among the honorary fraternities which elect psychologists. Membership in the National Academy of Science—the foremost recognition of scientific achievement in this country—is open to psychologists. In addition to these polyscience organizations psychologists are affiliated with a wide variety of special subject associations.

American Association for the Advancement of Science

The AAAS was founded in 1848 with the broad purpose of stimulation of scientific work in America. Membership is open to scientists in any field and to any other persons whose interest in science is sufficient that they are willing to support the work of the Association by applying for membership. Those members who are professionally engaged in scientific work may be elected Fellows of the Association. The AAAS has 15 sections representing different areas of science, and it has affiliated with it a large number of scientific associations. The program at its annual meetings is organized

around the several sections, and frequently a number of affiliated associations meet with it.

Psychology is represented by Section I. As early as 1882 there was organized a section entitled Anthropology which apparently included some psychologists because eight years later, in 1890, Joseph Jastrow was elected Secretary and the following year Vice President of it. In 1908 the title was changed to Anthropology and Psychology. Finally, in 1920 the two fields were split, with Anthropology remaining Section H and Psychology being separated into Section I. The APA and the Midwestern Psychological Association are both affiliated with the AAAS. Members of affiliated societies are eligible and invited to become members of the AAAS. *Science* and the *Scientific Monthly* are published by the Association; subscription to one or the other is included in the membership dues.

Other Associations

Evidence of the wide interests of psychologists is to be found in their memberships in professional associations. The list of organizations shown in Table 19 resulted from an analysis of the memberships recorded by members of the APA in the 1951 *Directory*. A 12.2 per cent sample, totaling 1,042 names, was obtained by taking the first full entry in each column of the *Directory*. These members recorded a total of 1,326 memberships in 179 different societies. Regional and local organizations and the APA and its divisions were omitted from the tabulation. Of the 37 societies having 6 or more members there are 6 national or foreign psychological associations. The remaining 31 include societies in medicine, statistics, management, education, vocational guidance, anthropology, sociology, and psychiatry; the societies with fewer than 6 mentions include all these fields as well as psychoanalysis, home economics, linguistics, physiology, and others.

Each of these associations has, of course, its own standards of membership which the psychologist must meet. It is not possible to present such details here. It must suffice to call attention to this additional evidence of the interrelations of psychological interests. Further information regarding these organizations or others in which psychologists may be interested can be found in the discussion of Bates (3) or the directory published by the National Research Council (A 73).

TABLE 19

Professional Societies to Which APA Members Belong

<i>Name</i>	<i>Per Cent of Sample</i>
1. American Association for the Advancement of Science.....	23.5
2. American Association of University Professors.....	11.1
3. National Vocational Guidance Association*.....	8.2
4. Society for Projective Techniques and Rorschach Institute.....	6.4
5. National Education Association.....	5.9
6. American Educational Research Association.....	4.2
7. American Sociological Society.....	3.9
8. American Statistical Association.....	3.6
9. American College Personnel Association*.....	3.5
10. American Orthopsychiatric Association.....	3.1
11. American Association for Mental Deficiency.....	2.8
12. American Catholic Psychological Association.....	2.5
13. International Council of Women Psychologists.....	2.2
14. National Society for the Study of Education.....	2.2
15. International Council for Exceptional Children.....	1.9
16. American Anthropological Association.....	1.8
17. Psychometric Society.....	1.7
18. Canadian Psychological Association.....	1.6
19. Society for Research in Child Development.....	1.5
20. American Medical Association.....	1.4
21. National Society of College Teachers of Education.....	1.4
22. Society for Advancement of Management.....	1.1
23. American Philosophical Association.....	1.1
24. National Association for Mental Health.....	1.0
25. Society for Applied Anthropology.....	.9
26. American Association of University Women.....	.8
27. American Association of Public Opinion Research.....	.8
28. American Psychiatric Association.....	.8
29. British Psychological Society.....	.8
30. National Council on Measurements Used in Education.....	.8
31. Acoustical Society of America.....	.7
32. Institute of Mathematical Statistics.....	.7
33. American Management Association.....	.6
34. Industrial Research Institute.....	.6
35. National Association of Deans of Women.....	.6
36. Optical Society of America.....	.6
37. Society of Experimental Psychologists.....	1.9
4 Societies with 5 APA members each.....	2.7
7 Societies with 4 APA members each.....	2.3
8 Societies with 3 APA members each.....	4.0
21 Societies with 2 APA members each.....	9.5
99 Societies with 1 APA member each.....	

*The NVGA, the ACPA, and the National Association of Guidance Supervisors have combined into a single organization since these data were reported.

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CHAPTER 12

Professional Problems and Responsibilities

The growth of psychology as a professional field has brought into prominence a number of problems which were perhaps unthought of by the small number of psychologists half a century ago. The scientific status of psychology is accepted, but its locus in the galaxy of scientific specialities is not clear. Its relation to other practicing professions is still subject to debate and disagreement. Within the profession there is concern over its public relations, its legal status, and its ethical responsibilities. Questions on such problems have been asked by all professions and have been answered by some. In this chapter it is our purpose to call attention to the situation in psychology. Activities of the APA relating to professional problems have been in progress for a long time, but there are few, if any, final solutions as yet. Professional maturity will be achieved in the next few decades, a period during which many readers of this book will be playing an active professional role.

RELATIONS TO OTHER PROFESSIONAL FIELDS

The application of psychological principles is involved in varying measure in the professional work of teachers, social workers, psychiatrists, lawyers, pediatricians, businessmen, and a host of others whose work involves dealing with and attempting to control human behavior. Any attempt to delineate firm boundaries between applied psychology and other professions is, by the very nature of the case, doomed to failure. The APA Committee on Relations between Psychology and Medicine in its report and recommendation recognizes this when it says: "Psychology as a profession does not believe that it is desirable to attempt to control such practices [i.e., psychological applications] by legally restricting them to members

of any single profession *unless it can be demonstrated that such restriction is necessary for the protection of the public*" (9).

This statement does not mean that there is no profession of psychology, but that this profession recognizes that others share its knowledge and techniques. In some cases, psychologists and members of the other professions use certain methods, techniques, theories, and specific interests, with each having a peculiar contribution to make. In other cases, the psychologist contributes new methods and theories to the other field's problems. The former situation may be illustrated by the use of interviewing by psychologist, psychiatrist, and social worker, of achievement tests by psychologist and educator, of selection and classification techniques by psychologist and personnel administrator, or of opinion polling by psychologist and sociologist. Illustrations of methods and theories are found in the contributions of psychologists to engineering design, to highway safety, to advertising and selling, to librarianship, or to military problems.

Problems of interprofessional relations have been the subject of discussion and publication for many years, and they are currently demanding considerable attention from individuals and official bodies. The relations between clinical psychology and psychiatry have been the specific subject of much of the discussion. Louttit (22) in a brief review of the prewar arguments on this matter implies that the psychiatric attitude at that time limited the psychologist's function to the giving of tests. Wartime collaboration between the professions resulted in a considerable change in attitude of both groups. However, there are still problems which involve questions of training, basic theory, social and legal responsibility, professional competence, and other matter which would lead us too far afield to attempt to review. In a delightful dialogue between Psychologist L and Psychiatrist T, Shakow (25) has explored the subtleties of the relations and has his Psychologist at the end of the last conversation point out the "need for psychologists to realize that full recognition in the field [i.e., clinical work with behavior deviations] can be achieved only by hard work and significant contribution, and not through any special rights." This statement applies to the profession as a whole, but more so to the individual psychologist. The development of cordial interpersonal relations with mutual respect between individual psychologists and individual

psychiatrists is basic to mutual acceptance of the two professions.

In his relations with other fields, the psychologist must not only recognize the special competences of persons in that field, but he must make a very particular effort to acquaint himself with the field so that his own professional contribution will be most fruitful. The psychologist working on the perceptibility of aircraft control panels cannot be entirely ignorant of the engineering problems involved. His colleague in a social agency must understand the nature and problems of case work if he is to be maximally helpful. And the clinician must be sufficiently oriented in medicine that he does not overlook an important physical factor in his client's problem. It is unrealistic to expect the psychologist to acquire professional preparation equal to that of the engineer, social worker, teacher, or physician with whom he may work. It is necessary that he make an especial effort to learn enough of the other field to appreciate its problems and to be able to see the significance of his psychological knowledge to those problems.

RELATIONS WITH THE GENERAL PUBLIC

The chief concern of psychology, as science or as art, is with the behavior of people. On this basis alone one might expect interest and knowledge on the part of the general public. Of the former there is no lack. Man is interested in his behavior, but his behavior is so much a part of himself that he has not been much concerned with its scientific study. At the same time knowledge has been based to a great extent on tradition, folklore, uncontrolled observation, autistic thinking, and a host of similar unscientific sources. Although not rejected, the scientific study of behavior has not been clearly distinguished by laymen from the uncontrolled, if shrewd, observations of their daily life. During the early years of this century this confusion was not of too great concern. The psychologist in his laboratory was usually dealing with bits of behavior; he cared little whether his slowly gathering knowledge would or could affect human living. Furthermore, his activities were with abstractly analyzed aspects of behaving; the responses of the total man to an ever present, yet everchanging, environment was a complexity not often subjected to scientific scrutiny. During the past twenty years or so there have been major changes in the direction of interest. Clinical, social, industrial, and educational psychologists have been

faced with practical problems which available scientific findings helped to solve only in part. These problems demanded answers and led research attention to more complex aspects of behaving individuals. Once psychologists worked not only with vision, or nonsense syllable learning, or maze running, or muscle actions, but were concerned also with personality, and attitudes, and propaganda, it became necessary that their fields of interest and their activities be known and understood by the non-psychological public.

Public Attitudes Toward Psychologists

The attitude of the public toward psychologists, or the extent of its knowledge of psychology, is essentially unknown. Guest (19) points out that although psychologists have made many studies of attitudes, through modesty or other reasons they have not turned their attention to a similar evaluation of themselves or their profession. That people with behavior difficulties do not frequently turn to psychologists for help is amply demonstrated by the reports of Yates (29) and of Steiner (26) 15 years later. In a very informal attitude interview study, Guest (19) had students secure information from 311 adults living in various communities in northeastern United States. Of these, 61 per cent said they would go to a psychologist to secure advice on their child's preparation for a vocation. That is good. But 29 per cent said they would least prefer their child to be a psychologist! Of the five alternatives—architect, chemist, psychologist, engineer, and economist—only the last approached this figure. For help in choosing employees 30 per cent would go to an economist, 27 per cent to an engineer, and only 25 per cent to a psychologist. Chemists were considered scientists by 92 per cent and psychologists were so considered by 55 per cent, these two leading the field of five. But 40 per cent would feel most ill at ease in social conversation with a psychologist compared to 16 per cent for economist, the next highest category.

Four questions were asked seeking information about psychologists:

(1) What types of work does the psychologist do? Clinical work was mentioned by 58 per cent, research and study by 45 per cent, business and industrial work by 5 per cent, and teaching by 2 per cent. Of the group, 22 per cent did not know what psychologists do, and 14 per cent mentioned a variety of miscellaneous activities.

(2) What would you suggest a person go to a psychologist for? Again clinical activities were first, with 84 per cent. Business and industrial problems were mentioned by only 2 per cent. Over a third, 39 per cent, would not suggest or did not specify a reason.

(3) How would you find a psychologist if you needed one? A third would turn to institutions, with colleges standing first, and a half to other people, with physicians standing first. One-quarter would turn to advertisements, with 19 per cent referring to the telephone book.

(4) Where do you believe you have got your ideas about psychologists? Reading was mentioned by 52 per cent, movies by 9 per cent, hearing about them by 56 per cent (radio mentioned by 12 per cent), and personal experience by 3 per cent. Only 61 per cent felt they had got a good impression of psychologists.

Daniel had graduate students repeat this study. There were only 114 respondents, mostly in the Midwest. The data, which are unpublished, do not change the general pattern of Guest's findings, although a number of the percentages suggest a more favorable attitude toward psychologists. Data from both studies, in spite of their inadequacies, are suggestive. They indicate that although psychology is not unknown, much can be done to better inform the public.

We have seen that 19 per cent of these respondents would turn to the telephone book to find a psychologist. How adequate is such a guide? David (15, 16, 17, 18) has reported on the advertising of psychologists in the telephone directories of 20 large cities. In 1947 the relation between size of city and number of psychologists advertising was indicated by a rho of .64. In that year there were 277 ads, mentioning 86 firms and 205 individuals. Of the individuals, only 38 were members of the APA, and of these 12 noted the fact in the advertisement. In 1948 there was an increase to 399 ads, with a drop in 1949 to 385. Of these, 97 were firms and 284 were individuals, with 101 of the latter being members of the APA. In that year no individual noted membership in the APA in his listing, which is in accord with the recommendation of the Association's Committee on Scientific and Professional Ethics. Unfortunately the listing in the telephone directories gives little evidence concerning the qualifications of the advertisers. David (17) says that in 1948 there was no way to make a distinction between psychologically qualified and

unqualified advertisers in 90 per cent of the cities. In Chicago the Illinois Association for Applied Psychology offered an information service in the 1947 telephone directory. Between January and June of that year 202 inquiries were received, presumably in response to the advertisement.

Public Relations

The material of the last few paragraphs is suggestive for indicating something of the need for, and problems surrounding, public relations for psychology. In its report for 1948 the APA Policy and Planning Board (10) considered the question of responsibilities of psychology. It felt there were responsibilities for fostering scientific research on problems of behavior, for applying psychological knowledge to problems of human welfare, and for disseminating knowledge of the science of psychology and of the applied psychological arts. These responsibilities must be shared by the Association and individual psychologists. They are owed to members of the profession, to students of psychology, to members of other professions, and to the public at large. It was felt that the APA should endeavor to create better public understanding of psychology, but that public information need not be, and should not be, for self- or professional aggrandizement. The Committee did not believe a public relations specialist should be added to the Central Office staff at that time; four years later, in 1952, a budgeted fund was voted for professional public relations service.

Perhaps the most notable activity of the Association in public relations has been the continual improvement of provisions at the annual meetings for news coverage. Space for a news headquarters and facilities for reporters have been provided. Every effort has been made to secure manuscripts of papers so that accurate news articles may be written. It is at this point that the individual psychologist is all-important. Many are fully co-operative, but there are still some who refuse to make their manuscripts available or who, though willing, are careless in seeing that it reaches the office promptly. Blakeslee (14) gives a newspaperman's point of view on the problems of psychological news stories; he indicates the interest of newspapers in having news of psychologists and their work, but at the same time makes clear many of the practical problems.

No data are available on the extent of news coverage of psy-

chological research and publications. In fact, Blake's analysis (13) of psychology in *Time* is the only systematic study yet published. In the 546 issues of *Time* appearing between January 1937 and June 1947 there were 271 articles which Blake included as of psychological interest. This was an average of about one each two weeks. During the same period there were 52,833 abstracts published in *Psychological Abstracts*. It is of interest to compare the distribution by subject matter in the two journals as shown in Table 20. Only in

TABLE 20

Subject Matter of Articles in *Time* and *Psychological Abstracts*
(after Blake [4])

Category	Time	Psychological
	Per Cent	Abstracts Per Cent
1. General.....	3	8
2. Nervous system.....	6	5
3. Receptive and perceptual processes.....	8	11
4. Learning . . . intelligence, etc.....	7	6
5. Motor and glandular responses.....	6	9
6. Psychoanalysis, dreams, hypnosis.....	6	3
7. Functional disorders.....	23	14
8. Personality and character.....	3	4
9. General social processes.....	15	11
10. Crime and delinquency.....	2	3
11. Industrial and personnel.....	4	6
12. Educational psychology.....	11	11
13. Mental tests.....	1	2
14. Childhood and adolescence.....	5	7
No. of articles.....	271	52,833

the case of "Functional disorders" is the percentage of articles in *Time* seriously different from the percentage in *Abstracts*. The *Time* stories were 26 per cent reviews of books, 22 per cent abstracts of journal articles, 15 per cent reports from national and regional meetings, and 13 per cent news releases from various activities and organizations.

It is agreed that the APA, especially through its Executive Secretary and Central Office staff, should facilitate public relations work for psychology. This they are doing. But as has been said, each member of the Association must also accept considerable responsibility. What can the individual do? Dael Wolfe (27), in a general

reply to many letters received saying "you ought to" get a publicity director in the APA Central Office, outlines the work of such a position and then points out that every psychologist can help by doing the same things. He suggests four activities: news stories, magazine articles, co-operation with newswriters, and general public education.

News Stories. Get stories presenting psychology and psychologists in a favorable light into newspapers. Local papers will use items regarding election to office in psychological associations, promotions, attendance at meetings, and the contents of papers read at meetings or published. If the college or other institution has a public relations official, he will be happy to have copies of publications from which he may prepare stories for wider distribution.

Magazine Articles. Few psychologists are gifted in writing popular articles for the large-circulation magazines or newspaper columns. Those who are do a great service to the profession in bringing its work, services, and values to the attention of a wider audience with professional soundness and a minimum of the spectacular. Co-operation of psychologists with professional writers is also to be encouraged.

Co-operation with Newswriters. Technical psychological publications or papers read at meetings are not always clear to the newswriter. Co-operation on the part of the author in answering questions and giving explanations for background orientation will result in more satisfactory news stories. This takes time but is invaluable in securing more intelligent public information.

General Education Programs. It is not to be expected that every psychologist can carry on an indoctrination course for the general public. He can, however, accept invitations to speak to lay and professional groups about his own special interests and the work of psychologists in general, and he can accept opportunities to participate in civic affairs as a psychologist. The teacher of psychology, especially in high school and the beginning college course, will influence many students who will enter a wide variety of professions—many more than will become professional psychologists. This opportunity may be used to increase favorable and understanding attitudes toward psychology. This is not to say that psychologists should herald psychology *ad nauseum*, but they should keep always

in mind the advantages of personal dissemination of psychological knowledge.

LEGAL STATUS

In the discussion of the listing of psychologists in urban telephone directories it was pointed out that in the usual case there was no way to distinguish the competent professional from the person who calls himself "psychologist" for business reasons. This is not the case with physicians, who are not so listed unless they have the M.D. degree and are licensed by the state. As the activities of psychologists have brought them into wide contact with the public, they have increasingly recognized the desirability of some means of identification both for the protection of the public and for the status of the profession. Although cynics may claim that the psychologists' effort to secure legal recognition as a profession is primarily a means of securing economic protection for an in-group, the long-continued work of scores of able, successful people would give evidence of a strong feeling of social responsibility. As long as Ps.D. (Doctor of Psychology) degrees, and others with more esoteric titles, can be secured by a minimum of correspondence study and \$50 or \$75, there is need for some method to assure the lay public that the psychologist to whom they go for help has at least the competence resulting from seven or eight years of intensive study. The M.D. degree and the medical license do not guarantee competence, but they do assure the patient that his physician is not entirely ignorant of the knowledge and methods of modern medical science.

The states have recognized the public interest in a wide variety of professions. Physicians, engineers, architects, dentists, barbers, and beauty parlor operators are required to be licensed before they can legally practice their professions. This does not mean that some persons do not start practice without a license, nor does it prove that the license holder is fully competent. But it does assure the public that action can and will be taken to protect their welfare by prohibiting unlicensed practice. It is the same sort of protection for the public and the profession that psychologists seek.

In discussion of this problem two terms are used which frequently are not clearly distinguished. Certification and licensing are both concerned with professional identification but by different means. As

defined by Remmlein, a *certificate* is "a document designed as a notice that some act has been done, or some event occurred, or some legal formality complied with, evidence of qualification" (24). It usually provides a distinctive title for ease in identifying a person so certified. A certificate may be issued by a state body or private group, but securing it is a voluntary act on the part of the individual. Teachers' certificates are usually issued by a state board upon proof by examination or otherwise of having met certain qualification requirements. Although public schools may be compelled to require a certificate before they enter into a contract with a teacher, the individual may teach privately, in a private school or elsewhere, without having the certificate.

A license is a document which gives permission by the state to engage in a trade or profession. Usually a license requires that certain qualifications be met and thus involves certification. It is, however, illegal to engage in the profession without a license regardless of the degree of competence. Thus the license provides legal sanction and control, including legal penalties for violation, and usually assures that certain defined qualifications have been met; the certificate does only the last of these. As a protection for the general public the license is to be preferred, although certification does provide an indication of qualifications for which the public may be taught to look.

Certification

Certification of clinical psychologists by the APA was first put into effect in 1921. The plan developed by members of the Clinical Section of that time established qualifications and included a fee. By January 1923 only 25 persons had applied for certification and of these only 13 were certified. In 1926 the names of 26 members of the APA to whom certificates had been issued were published. The whole program of certification was abandoned in 1927. The desirability of certification continued to be discussed within the APA, by the American Association for Applied Psychology, and by State Psychological Associations. Except for local activities (e.g., the New York State Association certificates), no formal action was taken until after World War II. The increasing involvement of psychologists in applied affairs pointed up the urgency of some means of identifying qualified professional psychologists. Continued discussion in the

reorganized APA led in 1947 to the formal establishment of the American Board of Examiners in Professional Psychology.

American Board of Examiners

The American Board of Examiners in Professional Psychology was incorporated in April 1947, following the election of the members of the first Board by the Council of Representatives of the APA. This was in accordance with a by-law of the latter organization proposed by its Policy and Planning Board in 1945 and adopted by vote of the APA membership in 1946. These elections were announced in January 1947. Following its incorporation, the ABEPP operated under its own by-laws and is now independent of the APA except that its own by-laws require that all members of the Board must be Fellows of the APA. The reasons for the independent status of the ABEPP are basically legal, but there is also the desire to keep membership in the APA free from any implications of certification. Corporate power to issue certificates implies the power to refuse to issue, as well as to revoke for cause. Either of these actions might be taken as a basis for litigation, which under the present arrangement would be with the ABEPP and not in any way with the APA. Although such action will probably never occur, the present arrangement ensures that the many other functions of the APA will not be jeopardized.

Examinations are given by the ABEPP and diplomas are issued in three areas: Clinical Psychology, Industrial Psychology, and Counseling and Guidance. Older members of the profession—defined in the "grandfather" clause as those having "received the bachelor's degree before 1935 and who have practiced in the specialty in which certification is sought"—who applied previous to December 31, 1949, were considered on their record and diplomas were issued with waiver of examination and/or the Ph.D. degree. The 1951 report of the Board indicated that under this provision 891 diplomas were awarded initially and 102 additional ones after appeal and review.

The examinations of the Board are both written and oral. The written examinations are in three sections: basic and fundamental psychological knowledge; knowledge peculiar to the special professional field; and knowledge in an option chosen by the candidate "as a basis of demonstrating specialized or intensive professional competence." The first written examinations were held in October

1949 and have been offered annually since then. The first oral examinations were held in November 1950. They included four parts defined as follows (1):

1. Diagnosis or evaluation. (The definition of the professional psychologist's problem.)
2. Therapy and/or recommendations. (How to solve the professional problem.)
3. Skill in interpretation and use of research findings. (What valid knowledge exists about the problem?)
4. Organization and administrative problems of professional psychology. (What are the conditions of professional practice?)

The names of new diplomates are published from time to time in the *American Psychologist*. The list that appeared in the annual report of ABEPP in the November 1952 issue included references to all previous lists and reported a total of 1,088 diplomas issued. Diplomates of the Board are so designated in the *APA Directory*, which also includes a list of diplomates classed by the field in which the diploma was granted.

Acceptance of a diploma from the Board implies willingness to conform to generally accepted ethical practices. In 1952 the Board (2) issued a statement concerning its ethical considerations which is subject to revision in accordance to any code of ethics adopted by the APA. The statement of policy prohibits excessive claims or flamboyant advertising; although the fact of being a diplomate may be indicated on letterheads or in advertising, there should be no implication of guarantees; questions of competition, fees, referrals, and relations to employees are mentioned; finally, attention is called to the provision of the by-laws for the revocation of a diploma according to a described procedure.

Licensing

Although certification by the ABEPP, or even by state or other associations, serves a useful purpose in indicating qualifications to the public, there are even greater advantages to be secured through legal recognition of the profession. Because legal status must be established by the states, efforts in this direction have been an important activity of the state psychological associations, with advice and support from the national associations. Licensing of the profession can be done only by statutory enactment, whereas certification

may be provided by statute or by administrative regulations. The latter is perhaps most commonly done under the state education agency. Horrocks (21) inquired of all state departments of education whether they provided certificates for school psychologists. Of the 42 states replying only seven—Connecticut, Indiana, Maine, Nebraska, New York, Ohio, and Pennsylvania—reported having such certificates; three additional states—Wisconsin, West Virginia, and Utah—had the matter under consideration; and six states provided for some type of certification for psychologists but not for school psychologists as such.

In discussing the problem of legal control of psychological practice, Wolfe (28) recommends licensing as providing better protection for the public. He suggests that bills for licensing of psychologists should contain a "grandfather" clause; they should provide for privileged communication; they should not define psychological practice so specifically that the profession is "frozen" in a pattern which will almost inevitably change; and provision should probably be made for certain exceptions, e.g., physicians or social workers. A number of bills for licensing have been drafted and introduced into state legislatures, but only one state—Kentucky—had passed such a bill by 1950, according to Peatman (23). He also reported that legislation for licensing was then under way in 12 states. State statutory provisions for certification exist in Connecticut, Virginia, and Minnesota. Georgia enacted a licensing law in 1951 (30). San Diego, California, passed an ordinance in 1948 to license psychologists practicing in that city. An anonymous writer (11) in 1951 reviewed the whole problem of legal regulation of psychological counseling and psychotherapy from an entirely legal point of view. Any statement concerning the status of legislation on this matter would soon be out of date because of the continuing activity in the field. The history of the postwar years indicates that licensing of psychologists is recognized as important and necessary and it is only a matter of time (and work!) before all states have legislation.

ETHICAL PROBLEMS

Psychology, in common with all professional activities having a social value, is faced with questions of ethical practice. Although applied practice in psychology began very shortly after the beginnings of the modern science, its rapid growth during the last quar-

ter century has made ethical questions most pressing. Isolated cases of alleged violations of professional ethics are reported in the proceedings of annual meetings as being considered by the Council of the APA in a number of years. However, there was no code of ethics and no formal procedure for dealing with such problems in the Association. In 1938 a Committee on Scientific and Professional Ethics was appointed and charged with the investigation of, and recommendation for action on, alleged infractions, and also "to consider the advisability of drafting an ethical code, the purpose of which would be to serve as a guide to Members and Associates." This Committee reported in 1940 that, in its opinion, it was premature to legislate a complete and final code at that time. They had handled cases and they recommended that there should be a standing committee of the Association which, in addition to dealing with reported cases, would "formulate from time to time rules or principles of ethics for adoption by the Association."

This recommendation was apparently not followed, or at least any efforts in this direction were interfered with during the war years. A number of individuals and committees of other associations published more or less formal suggestions for a code of ethics during the 1940's. In 1947 the Committee on Scientific and Professional Ethics, in their report to the annual meeting, recommended that the Association appoint a representative group to begin study on the problem of formulating a code of ethics. The Council of the Association in 1947 appointed a Committee on Ethical Standards in Psychology. Because of the excellent work so far done by this Committee, it is unnecessary to review here the earlier publications.

In the earliest report from this Committee (20), a statement from Bixler and Seeman (12) is quoted as representing a basis on which the Committee might work. These authors had earlier said: "A genuine and practical code of ethics, however, stems from a philosophy as well as a need. Ethics are principles of action based on a commonly accepted system of values, and agreement upon these principles and values must be reached before progress toward an acceptable code can be expected." The Committee proposed that the formulation of a code of ethics should be approached from a research point of view. Their plan, which has been carried out, was to request all members of the Association to submit actual incidents which the person submitting considered as illustrations of problems of an ethical nature. The Committee critically reviewed, analyzed,

and classified the incidents received. From the data so obtained they have published a series of reports which present examples and a formulation of ethical principles made by the Committee. These reports have been published with an earnest request for comment and criticism by individual psychologists and by groups of psychologists. The Committee have published six reports in which a code of ethics is formulated under the following major divisions:

1. Public responsibilities. (8)
2. Professional relationships. (7)
3. Client relationships. (3, 4, 5, 6)
4. Research. (7)
5. Writing and publishing. (7)
6. Teaching. (8)

The several reports of the Committee are so extensive that we cannot undertake to summarize them here. Following their publication, members of the Committee received comments and criticism from many psychologists and the tentative reports were the subject of formal and informal discussion in many psychological groups. At the 1952 meetings of the APA it was voted that the revised report be adopted for a three-year period. For this interval it would be the official Association Code of Ethics. During the third year the code will be reconsidered in the light of experience, revised if necessary, and acted upon again for a more permanent adoption. This report has been published by the Association in two booklets, one containing the full official code (2a) and the other "presenting in brief the major tenets of the code" (2b).

A question may be raised whether a code of ethics is necessary for a profession. It is certainly true that the members of a profession are expected to carry out their professional activities within the mores of the culture in which they are working. Furthermore, from generalizations of general ethics do not always apply to circumstances unique to a professional field. There is, therefore, a value in formulating a particular code for the special field. The present work of the APA Committee promises to be of basic significance in this direction.

CHAPTER SUMMARY

It has been the purpose of this chapter to introduce a number of problems about which there is at present a great deal of discussion. Quite frankly we admit that we have made no attempt to give cate-

gorical final answers to problems in professional relations, public relations, certification or licensing, or professional ethics. Our aim has been only to set forth the problem, and to illustrate the nature of the evidence. Final solution will not be found for some decades, and the graduate students of today will be active participants in the process.

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CHAPTER 13

The Psychologist in the Academic Scene

In the preceding chapter emphasis was placed upon the professional problems of the psychological practitioner. We now direct attention to those professional problems which are traditionally identified with the academic psychologist. The reader will recognize, however, that all members of the profession must be concerned with public relations, legal status, and ethics. Furthermore, the problem areas most vital to the psychology teacher are not his alone, but in most cases relate directly or indirectly to all of us. The impossibility of clearly delineating the two is underscored by the fact that a great many psychologists are engaged in both types of activity. The undesirability of dichotomizing is compatible with the present effort toward a unified professional organization.

Since psychologists have been associated with academic institutions throughout the entire history of the science, and only recently turned in large numbers to the applied fields, one would expect to find the professional problems of the professors rather completely solved. This is true to a certain extent. Teachers of psychology share problems and solutions with teachers of other subjects. Official APA concern with the teaching of psychology began at least as early as 1910, when a special committee reported its findings and recommendations (53). Yet there are many aspects of these problems which remain puzzling. Stirrings of interest, as indicated by dates of citations, show continuing concern for better solutions. The shifts of emphasis within the profession, mentioned repeatedly in this book, reflect back into the classroom and the laboratory of the academic psychologist. It is obvious, too, that the young psychologist entering this field deserves an orientation into the nature of problems he will face. Such is the purpose of the present chapter.

TEACHING

The number of psychologists employed primarily as teachers at the present time is around 40 per cent of all U.S. psychologists. The figure would be higher if we should include all of those who do some teaching or are responsible for training in some manner. It is clear that a major task is the perpetuation of the science through instruction. It would seem that we should ask ourselves occasionally how well this function is being served. There is no lack of material available; indeed, bibliography on the teaching of psychology has now become impressive, both in quantity and in quality. We shall attempt here to point out the major issues, suggest some solutions, and point to sources where the teacher may seek further information toward the improvement of his job. No attempt will be made to cover the literature on teaching in general, since any academic library catalog will serve as a source for such material. The book on college teaching by Cole (15) has been widely recommended and the "General Education" report of the Harvard Committee (27) will aid the new teacher in gaining a wider perspective of college teaching within the educational scheme. Journals such as the *Bulletin* of the AAUP frequently carry significant articles on problems of teaching. As an additional limitation upon our discussion, we shall emphasize the first course in psychology, since teaching that course is one of the first professional problems encountered in an academic career. Introductory psychology is taught in more than three-fourths of all institutions of higher learning in the U.S. (51), and in the high schools of at least 34 states (18).

Objectives. Unless the teacher clarifies the objectives of his course to himself and to his students the result is likely to be a rambling affair offering satisfaction to no one. Although certain introductory courses may be designed for special purposes, the usual emphasis is upon one or more of the following objectives:

1. Knowledge of the facts, principles, problems, and methods of psychology.
2. Appreciation of the scientific method and the scientific attitude and how each pertains to the study of human behavior.
3. Personal insight (including mental hygiene, social adjustment, and vocational choice) and personal growth.

4. Knowledge of the contributions of psychology to practical problems (psychotechnology).
5. Eliminations of misconceptions about human nature and education against psychoquacks.
6. Preparation of students for advanced courses.

The first or the first and second of these objectives characterize the traditional course, whether stated and clarified or implied and arrived at by default. As compared with the objectives of other college science courses, they are sound and ambitious enough, especially No. 2, since beginning students have not been taught previously to look upon behavior with scientific objectivity. As an introduction to advanced, technical courses, a survey and integration is undoubtedly of utmost importance. In addition, such a course, if well taught, serves to fill in a vital area in the cultural background of the liberal arts student. In all probability courses with these objectives are and will continue to be dominant in our offerings. Elaborations of the first and second objectives became the guiding principles for an "ideal" first-course plan developed by a study group of which Wolfe (68) was chairman.

However, in psychology and in some of the other sciences as well, *personal needs of the students* (as distinguished from strictly cultural needs) have attracted the attention of a few teachers willing to devote time to the development of new methods emphasizing different objectives. As so frequently observed, few students in any beginning course go on to major in the subject, and fewer still choose psychology as a career. Recognition of this fact has stimulated new ideas for the first course. Remmers (47) some years ago made a strong appeal for psychology courses (from the first on up) to have more contact with real human problems; and Pressey (45) has pointed out that if psychology does not supply these needs, some other group (perhaps less well equipped) will supply them. Aid in solving present and future personal problems is the most frequent reason stated by students for taking psychology. Many teachers have accepted these needs as at least equally as valid as the more traditional ones. Two studies (23, 49) more than ten years apart and for different parts of the country indicated that such objectives are given greater weight in the junior colleges and smaller four-year colleges than in the universities. However, reports in recent years on courses at Colgate (8), Colorado (22), Syracuse (4), and

other universities indicate that these objectives are demanding greater attention. The rationale of the approach has been clearly presented by Rogers (48, Chap. 9). He discusses the problem within the intellectual framework of democratic education and stresses the importance of designing teaching toward the goal of assisting students to become self-directed, critical, flexible individuals working in terms of their own socialized purposes.

Elementary psychology may be taught in such a manner as to compromise between these two viewpoints, and that is the way many of us teach. However, one may question the degree to which any of the basic goals are reached in so short a time as is usually available. With several ambitious goals, the thoroughness is likely to be less than satisfactory. The courses of the student-centered type reported as successful have apparently devoted greatest attention to this goal alone. The full-year course, with successive or carefully intermixed attention to (a) scientific principles, facts, problems, and so forth and (b) human relations and other applications, has been attempted in a few locations, but not evaluated against other plans, so far as we know.

The remaining two listings we consider as secondary or inappropriate for the beginning course. Instructions about "what psychology is not" can be specifically discussed within an orientation topic and covered by implication thereafter. It would hardly seem sufficiently important to serve as the design for a whole course. Objective six, preparation for advanced courses, is questionable on several counts in addition to the fact that few of the students will make such use of their training. Second-level course texts duplicate elementary material which is pertinent (42, 66); the dependence of higher upon lower courses in an elementary sequence is often less real than merely expedient; and this objective is misplaced—it belongs to the sophomore or junior "Advanced General" course.

Organization. The typical elementary text is dominated by the content and methodology objectives just described; it is eclectic (possibly to an extent of being *dis-organized*); and it can have any one of a very great number of possible topic sequences. There are exceptions to these characterizations, of course, and a teacher usually can find one that matches or almost matches his own choice of objectives, emphasis, and organization. If not, then he will sooner

or later write one following his own pattern—a fact witnessed by the large number of available texts! A less strenuous and therefore more frequent procedure is to structure the course syllabus, then dismember the text outline and reassemble it into the preferred pattern. Students seldom protest such treatment, but one may well wonder about its effect.

What topics to include, how much emphasis to give each of them, and the sequence in which they are taken up (and/or integrated) may be determined by any one of several criteria. For example, the theoretical position of the instructor, the amount of factual material available, what has been judged valuable for the students, or what students are interested in, or some strictly logical system, such as concrete to abstract, may serve as criteria. Ruja (50) makes a good case for a single criterion—interest plus understanding—and questions some of our traditional assumptions about topic order. Wolfle's group (68) recommend either of two plans: developmental sequence or cross-sectional approach, and they emphasize *consistency* whichever of the two is chosen. Although the detailed answer to the problem of order will differ according to the criteria selected, a great deal of overlap will exist, and the planful teacher can usually derive a satisfactory course sequence having some contact with general criteria. Some suggested schemes can be located through the citations given in the list of references. One excellent bit of advice is to scatter rather than lump topics which have low interest value but which are included for reasons other than student choice.

Methods. Little evidence exists for superiority of any one of the traditional methods over any other. Cross-comparisons have been made between the following pairs of class types: lecture-discussion, lecture emphasis-text emphasis, lecture-project, large section-small section, laboratory-no laboratory, and various subcombinations. As pointed out by others, failure to demonstrate differences may merely reflect our inability at present to measure teaching effectiveness reliably.

Several recent contributions to methods of teaching and course structure are of interest because of their break with the traditional lecture pattern. Non-directive class discussions (1, 4, 19, 41), "democratic" class operation (56), "participative action" (22), case-his-

tory analysis (8, 14), group research (62), "reality practice" (28), and "buzz sessions" (44) are among those reported for introductory classes. Evaluations indicate that students usually learn no more (sometimes less) about the content of psychology than do other students in control (traditional) classes. However, there is evidence that they gain more in emotional adjustment, tolerance, leadership, and other non-intellectual, attitudinal, or general personality variables. The criticisms by students against these experiments in teaching center around the problem of wasted time, inefficiency in coverage, and a lack of direction. Other critics (68) have raised the question of (a) the teacher's implied claim to skill in directing group therapy and (b) the propriety of replacing intellectual development by personal growth as the sole aim of the first course. Smith (57) notes that "it is unfortunately true that the nearer psychologists come to the matters that people care more about, the shakier are our conclusions and the more we disagree with one another about the most promising leads for future investigation." These issues are fundamental and important. They deserve comprehensive, empirical study. It would seem that a future step should be to investigate the value of a content-centered first semester and a non-directive (or variant) method the second semester in a continuous year sequence.

Teaching Aids. Experienced teachers feel that whatever method is used, some teaching aids other than the textbook make for more effective learning. Aids range from outside readings (a *reader*—not another text) through slides, films, recordings, demonstrations, and projects to full-blown laboratory experiments and field investigations.

Laboratory work with the beginning course seems to be increasing in popularity as budgets expand. There is a difference of opinion regarding the advisability of running a low-cost laboratory with makeshift equipment. Although it may give the undesirable impression that psychology is the poor relation of the sciences, nevertheless some experience at data collecting and experimental methodology is better than none, and the attitude of the instructor is at least as important as the quality of the equipment in determining student attitude and enthusiasm. Laboratory time need not be entirely devoted to experiments. Indeed, a well-planned demonstration or a

film with provision for student discussion-participation (see Chapter 9) may be superior for certain topics. Andrews (3) has reviewed the literature on demonstrations suitable for the first course.

New materials available for teaching aids in the classroom or laboratory appear from time to time and can be located through the regular sources listed in Appendix A. Many of the publishers, manufacturers, and dealers listed in Appendix C offer apparatus and materials suitable as teaching aids. Useful suggestions on the planning of laboratory work will be found in articles by Bousfield (9), Keller and Schoenfeld (32), and Schlosberg (52), and also from the several standard laboratory manuals listed by various publishers. Note also the possible use of student study manuals and review outlines such as McKeachie's (37). The book by Dale (16) has been recommended as a good source for the use of aids in an integrated teaching program. A comprehensive, annotated guide to the films useful for psychology courses has been compiled by Manoil (A 131). Katz (31) has assembled information on audio-visual aids for clinical psychology.

Professional Problems of the Teacher. In addition to problems directly related to the planning of his course, the teacher faces other professional problems of considerable importance. Among these is one which in our opinion is too often neglected—student appraisal. We cannot expect all teachers to be experts in research on measurement; nevertheless even teachers of the introductory course should be capable of applying the fundamental methods of achievement test construction. Altogether too frequently measurement of the effect of one's teaching is a sloppy affair which could not be expected to have decent reliability or validity. It is suggested that a minimal level of skill here is a working knowledge of one of the several manuals on the subject (e.g., Weitzman and McNamara, 63).

We have previously (Chapter 12) discussed the problem of professional ethics. The teacher must be aware of the fact that ethical decisions stem from interpersonal relations in the classroom and with the staff and the faculty as well as between a consultant and his client. Section 6 of the APA Committee on Ethical Standards Reports (see Ref. 8, Chap. 12) presents problems, typical incidents, and principles relating to four aspects of teaching: (a) responsibility to students (e.g., to what extent may self-revealing, autobiograph-

ical material be required?); (b) responsibility to subjects used for research or instruction (e.g., what about the rights of children, mental patients, or others "demonstrated" before classes?); (c) responsibility to the department in which one teaches (e.g., what outside activities warrant absence of the teacher from his classes?); and (d) responsibility to the subject field which is taught (e.g., how achieve proper balance between the desire to "build up" enrollments, yet teach a course with respectable achievement standards?). By becoming aware of the fact that he makes ethical decisions and that his teaching practices have ethical implications, the teacher has made a first step toward the development of a code contributing to sounder professional service.

A third problem to which the psychologist as a teacher should contribute careful planning and eventually perhaps some research is that of intra- and inter-course organization. Survey studies (29, 51) indicate that the number of courses offered by psychology departments is surprisingly large. Of course some of this proliferation is a matter of unstandardized course titling—a minor aspect of the basic problem. Anyone who has attempted to evaluate the transcript of a transfer student knows very well the difficulties involved.

Teacher Training. An observation that large numbers of Ph.D. graduates each year go into university and college teaching with insufficient training in teaching is surely nothing new. Only recently, however, has there been published evidence that steps were being taken to correct the situation. Buxton (11) in 1950 listed 14 universities where seminars were regularly offered on the teaching of psychology. He has also reported (10) the results of a survey which indicated that a great deal of the training provided was too haphazard and unsystematic to meet minimum standards. Furthermore, he argues well for formal courses with academic credit, to be emphasized (at least for those candidates who plan to teach) in a manner comparable to the present practicum or internship programs (for those preparing for psychological practice). Since something of the sort has also been discussed for the training of research psychologists, addition of teaching seminars or systematic practica to the graduate curriculum would appear to be entirely appropriate and of considerable value to the young instructor.

A few of the existing training programs have been described in the literature. McKeachie (36) discusses the plan used at Michigan;

Freeburne (20, 21) tells how a block of general seminar meetings on teaching developed into a co-ordinated program at Bowling Green (Ohio) State University; and Webb (61) has outlined some fundamental requirements for such a course, developed from a survey of 50 departmental chairmen, the majority of whom felt that teacher training was badly needed.

Judging from these sources and our own observations, the following characteristics, topics, and techniques ought to be seriously considered in the development of any preparatory program for college-level teaching of psychology:

1. A seminar, with credit, required of Ph.D. candidates who expect to receive teaching appointments and M.A. candidates who may become part-time instructors or who seek a career in junior-college teaching.

2. The content of the course might include most or all of the following topics: (a) survey of the literature on the teaching of psychology, (b) survey of elementary texts, (c) review of objectives and the best teaching methods for reaching those objectives, (d) techniques of testing, and (e) organization and operation of the department and the college.

3. Actual supervised practice in an elementary course consisting of full responsibility for not less than one unit of the course (e.g., learning topic) including planning and testing.

4. Use of one or more of the techniques of (a) observing experienced teachers, (b) being observed and criticized by experienced teachers and/or other graduate students, (c) recording of lectures or discussions for self-criticism, and (d) specific instruction in speech when needed.

5. Offer the course as a department or explore the possibilities of operating a joint course with other departments. Since many of the problems are not unique to psychology, though some are, a plan of some joint meetings and some departmental meetings ought to be workable.

Further Sources. The literature on the teaching of psychology was reviewed in 1942 by Wolfe (65) and, without duplication, in 1950 by Buxton and Albaugh (13). Their combined bibliographies run to 162 items. Division two of the APA has been very active in promoting interest in the problem, largely through papers and panel discussions at the annual meetings and regional meetings.

Munn (43) considers some provocative questions, such as "How much physiology should be taught?" In the summer of 1951 six psychologists worked together for several weeks in the development of a recommended program for undergraduate instruction. Their report (68), to which we have referred previously, considers objective, methods, curriculum, and other problems pertinent to the first course, in a recommended plan which we expect will stir up some heated discussion and, we hope, initiate some badly needed research.

RESEARCH

"Teaching vs. Research." In the thinking of academic scientists there often exists an essential conflict between these two activities. Choice or circumstance leads each man eventually into a pattern which may be thought of as being somewhere on a scale between the career teacher, who does no research after his dissertation, to the research man, who is able to find a university wealthy enough to support him full-time at *his* chosen task. Between these two extremes will be found teachers who are able to satisfy to a greater or lesser extent their urge to creativity in research. Although there are relatively few psychologists employed as research professors in universities, there are, on the other hand, many who *prefer* the teaching function to the exclusion of research. This viewpoint should certainly be respected; there is no justification for considering the career teacher as a "second-class citizen" in the psychological community. Buxton (12) has ably defended teaching as a respectable goal, pointing out that skill in the production of students requires different talents, value systems, and requirements for success. Watching a student develop intellectually under one's tutelage can be every bit as rewarding as finding the answer to a research problem. Indeed, the "inspired teachers" of smaller colleges are given the greatest credit for the higher productivity rate of scientists from these institutions than exists for the larger universities (24).

How these two constellations of abilities interrelate we do not know, for the definitive study has yet to be made. Buxton believes that teaching and research skills have a very low positive correlation. In contrast is the opinion of Smyth (58) that "... the urge to learn through research is usually accompanied by the urge to teach. . . ." Sibley's survey data (55) agree with Buxton's opinion,

but he quotes a Princeton University study where a high positive correlation was found. Clearly we must develop more reliable measures of both teacher ability and research ability before a final answer is possible. For the present we know that some persons are good teachers, others are good researchers, and a fortunate few seem to be equally good in both endeavors.

On the other side of the picture we find so very many teachers who are forced by circumstance to abandon research. When such a person's interests and talents favor research, his is the real problem. Three major factors contribute to his unhappiness: lack of time, lack of money, and lack of stimulation. On all three counts the disappointed researcher all too easily blames his institution and its management. Some administrators *have* in the past discouraged faculty research in the belief that it interferes with teaching, but this has declined generally to a minor difficulty at the most, according to Sibley (55). He quotes an anonymous writer who makes the point that teachers who invite students into learning "must appear mildly fraudulent, at least, unless those who issue it are themselves actually adventuring." And furthermore, Sibley adds, ". . . the academic community cannot maintain a healthful intellectual climate unless its members [or some of them, he says elsewhere] are actively pursuing new knowledge. . . ."

The first two mentioned difficulties are not as easily answered by reasoning or "education." In the smaller, less wealthy institutions this is an especially serious problem, even where research is culturally encouraged. We can give no ready-made solutions which will fit every ambitious researcher's situation. Pertinent to the establishment of motivation in the young scientist who goes out to face these difficulties are certain ideas worth pointing out: (a) administrators can generally create time more easily than money for research; (b) much worthwhile research in psychology can be done with relatively little monetary investment; (c) a pilot study, done on a "shoestring" budget, is more likely to attract research money than is a rough idea on paper alone; (d) a brilliant idea investigated on a small budget is more generally rewarding than a pedestrian idea with unlimited funds.

"Lack of time" is the reason most often mentioned by scholars for their failure to do research. Sibley's average professor (of 1,300

cases) spends 37 hours per week in teaching and administration, one hour in outside employment, and 11 in creative activities including research (55). This totals a 49-hour week! And the data are from institutions where conditions are relatively favorable for research! The 14 institutions represented in the sample varied but little in this total figure, but proportions of time at different tasks was not so stable. In analyzing his data, Sibley found several bits of evidence that research was a "marginal" activity—carried out at the expense of leisure time or personal obligations. Thus, one pretty generally gets the picture that colleges and universities hire a professor for teaching, and then (the cynic notes) promote him not for the work he is hired to do but for the research for which they have meagerly provided support. Such a conclusion is an oversimplification, and it ignores possibilities practiced at many places, such as occasional reduced schedules, leaves of absence, summer months which are free, or summer research appointments.

One should not overlook the probability that lack of research productivity is less a function of the present conditions than of the make-up and background of the would-be researcher. It is easy to find examples of sound research produced in spite of adverse environment. Manis (38) found some evidence that pre-Ph.D. factors were more closely related to research productivity in social scientists than were later on-the-job factors. Sibley, whose monograph has been previously cited, is tempted to report that one factor differentiating those scholars who are productive is "determination," but he fails to find any clear-cut genesis for it in the contemporary culture of the scientist. The delicate problem of research stimulation by academic promotion rewards has many dangers. On almost every campus where some of the faculty are active in research this is an unsolved problem. The literature on factors leading to creativity would suggest that selection and early training should be given more attention, and the considerations discussed earlier in this section lead us to suggest that service in discovery and in dissemination be rewarded equally. Undoubtedly this is easier to accept than to administer!

The ideal relationship between teaching and research is very nicely stated by Wagensteen. It is quoted here because it reflects the attitude of so many academicians.

To isolate . . . investigators from [student] contact is to make them sterile in research, to load these same men with heavy teaching schedules . . . is to deprive them of the time and energy to do research. . . . Research gives enlightenment and meaning to our teaching and teaching the controversial problems associated with our special fields of activity affords problems and ideas for our research (60).

Group vs. Individual Research. In recent years psychology, along with other sciences, has experienced an appreciable increase in research by groups of scientists working together in an organized fashion on a well-defined problem. This has been largely, but not exclusively, a product of support of research by public monies. Consequently, the problem is closely related to applied vs. basic research, which we shall discuss in the next section. It is also fundamental to a consideration of the future of all research in psychology, as so ably discussed by Marquis (39). There are, of course, various patterns possible within group (or "team") research. Sometimes each scientist works on a subtask, which may be a long-time and relatively self-contained project. Again, the group may operate in a mutually dependent fashion. The majority of group projects sponsored (i.e., financed) from outside a university setting tend to be more like the latter than the former. In individual research, as the term implies, the lone scientist usually does the whole job, from idea to published report, on his own initiative.

Which of these plans is best? Which is most satisfying to the scientist and most productive for the science? There is no categorical answer. Some workers are not suited by temperament to the close co-operation, scheduling, and other aspects of group research; others need the intense stimulation which such a program provides. Scholarly work for many is incompatible with progress reports, administrative details, and deadlines; others find that these same pressures increase the quality and quantity of their output. In short, each person seeking a research career, in whole or in part, must answer this question for himself.

Opposite viewpoints on this problem have appeared in the literature from time to time. An interesting contrast is provided, for example, in (a) a symposium of psychologists (reported by Seidenfeld, 54) presenting the case for organized research, and (b) the monograph by Sibley (cited in another connection previously),

who argues for the independent researcher. Among the advantages of group research, it is proposed, are (a) greater efficiency, (b) larger funds, which in turn mean (c) better equipment, and (d) more assistance. It was brought out in the symposium that universities are coming to feel a greater responsibility for the production of knowledge, and that teaching and research are not necessarily functions to be invested in the same person for the greatest good. The members of the group concluded:

It would appear from the representative symposium of established professional workers in their field of organized research in academic, governmental, and private voluntary agencies that research in such agencies is likely to be as satisfying to the ego, as professionally stimulating and as productive of representative research as would be true in the so-called "pure research" environment more often considered to be present in institutions of higher education or research institutes (54).

Sibley believes that grants to individual workers by the large foundations have probably contributed more to the advancement of knowledge, in proportion to the money spent, than have large organized projects. In his own words:

The scholar who is sometimes called a "lone wolf" might better be thought of as a self-directed research worker. He may have conceived a new idea which he wants to explore, or he may be interested in re-examining the ideas of others; in either case he needs to be free to determine what he shall look for, and to make his own interpretations of what he finds . . . The essential thing is the scholar's intellectual autonomy, not his physical or social isolation from others. The objective to be sought is the preservation of this autonomy within the existing framework of social organization (55, p. 3).

He goes on to admit that applied research, purchased to fill a particular need at a particular time, is perhaps more efficiently produced in groups. We should add that interdisciplinary research, too, is most profitably tackled by a *team*. But, he says, "free trial and error, unhampered by restrictions and unhurried by demands for quick answers, has been and will doubtless remain the process from which some of the most fundamental new insights and discoveries are achieved." We leave the reader to formulate his own rebuttals to these positions and to evaluate, by developing these basic ideas, any decision he must make in a choice of research opportunities.

Applied vs. Basic Research. This is a problem we try to clarify for our beginning students, who are often aware that a newspaper "science" story is more likely to be about technology. There is, however, a danger of oversimplification. One searches for a void between the two without success; one looks for differentiating definitions without finding satisfaction. Perhaps the most reliable distinction that can be made is in the motivation of the scientist. In the case of basic research ("pure research" is an unfortunate term) the objective is the advancement of knowledge; in the case of applied research it is advancement of utility or, in more general terms, the standard of living. As stated by Smyth, "the objective of science is to understand the laws of nature, whereas the objective of technology is the immediate improvement of the material conditions of man" (58).

Among others, Melton (40) takes exception to this view. From his experience in both aspects of research, traditional laboratory and marketable applied varieties, he emphasizes a distinction on the basis of *generalizability*. Research is basic, he believes, if it produces results which may be generalized *either* into theory and understanding *or* to the immediate problem and others like it which one may anticipate encountering. Following this definition, long-range planning of military and other "applied" research programs results in basic research, whereas that which satisfies only an immediate passing need, however critical, is applied.

Sources of Research Funds. Where do psychologists find financial support for their research? An answer to this question was found by two students in a class project directed by Daniel (unpublished report). The procedure was to scan six psychological journals known to be the heaviest "contributors" to literature citations (see report of journal study in Chapter 3). The five-year period 1946-1950 was used. Approximately one-fourth of all the research articles published therein included footnote acknowledgment of financial assistance. Table 21 shows how these studies break down by source of funds. The figures should be considered as only approximate of the true situation because (a) funds of local origin may not always be acknowledged, (b) military sponsored research is less likely to be published in journals than is that of other sponsorship, and (c) the data are on the basis of number of articles,

TABLE 21

Source of Funds for Acknowledged Research Support
in Six Psychological Journals, 1946-1950

	<i>Per Cent of Articles</i>
Special university research funds.....	43.7
Private local funds.....	2.9
All local sources.....	46.6
Military, government funds.....	38.9
Research foundations.....	14.5
All non-local sources.....	53.4
Total.....	100.0

not number of projects, thus favoring larger grants which produce more articles.

In the military and governmental group the Office of Naval Research was most often acknowledged. Among the grant-in-aid donors, the Scottish Rite Fund was most frequent. Psychology seems to be less well represented in grants awarded by the large national foundations than we should expect to be the case, although a number of them accept applications in our field. One suspected reason for this is that specializing foundations are confused about psychology—there is a tendency to let some other group take care of our requests. This point is evident at several places in a recent report of the Rockefeller Foundation (6).

In view of the large proportion of acknowledgments of local funds, and further assuming that most if not all unacknowledged support is truly local (existing equipment, space, assistance, and so on), then it would appear that about 85 per cent of recorded psychology research is, at present, paid for by colleges and universities. Fields such as agriculture or medicine would show quite different values. For example, Deignan and Miller (17) report that in 1951 government funds alone "provided for nearly 66 per cent of the total support of medical research." In this study it was shown that the category "human resources" received less than 2 per cent of all governmental and private (non-local) research funds (in medical and allied fields), although some psychological research is undoubtedly also included in the categories "mental health" (4.29 per

cent) and "problems of children" (2.04 per cent) and to a lesser extent in one or two others. Whether our situation is good or bad is a matter not readily answered, but several considerations would need to be drawn into such a judgment.

There are a few sources of information available to those seeking grants from federal and private national sources. Syracuse University has sponsored the compilation of a guide (A 213) to federally financed research in the social sciences, including psychology. Pertinent also is an article by Lanier (35) which is helpful to an understanding of the organization of federal units concerned with psychological research and certain problems encountered in such research. Raymond Rich Associates publish the most comprehensive guide (46) to the foundations. This book gives officers and addresses, as well as statistical information about resources and grants, and indicates the research fields in which each foundation is interested. There is great hope for the fostering of basic research by the new U.S. National Science Foundation, which has been discussed from the standpoint of the psychologist by Wilson (64). The various private foundations usually issue annual reports, and information about applications is available upon request. Among the larger organizations which have made grants for psychological research in recent years are the National Research Council, the Social Science Research Council, the Rockefeller Foundation, the Guggenheim Foundation, John and Mary Markle Foundation, American Philosophical Society, and the American Academy of Arts and Sciences (Permanent Science Fund).

Applying for research funds is not simply a matter of filling out forms and writing a brief prospectus. Foundations are limited in their resources and almost always have more applications than they can grant. Although they may in theory be set up to support the individual investigator, they are of necessity loath to support research in the absence of evidence that he will produce. This tends to handicap somewhat the younger man who is not well established. At many universities it has been found extremely helpful to form a local committee which serves the dual purpose of aiding staff members in making applications and in carrying on preliminary correspondence with the foundations, co-ordinating and integrating programs, and actively promoting the raising of funds. Any of the following characteristics will probably tend to increase the interest

of a foundation: research which is already under way, is partially financed locally, has unqualified support of a responsible local research committee, may have practical or research-stimulating consequences, and is part of a long-range or very broad (interdisciplinary) program. The advice that the scientist "first make an important discovery" may be discouraging since "that is what the grant will do"; nevertheless this is almost a guarantee of support. Fortunately, science progresses through a synthesis of well-known facts as well as by the rare original discovery, and foundations certainly sponsor such work.

ACADEMIC STATUS OF PSYCHOLOGY

Where do we stand in the academic scheme? Administrators view psychology with respect in the academic family, but the dean may never be quite sure where to pigeonhole the psychology department when it comes to an academic "table of organization." Psychology is certainly unusual, if not unique, in the degree to which it is closely related to a wide array of other scientific and professional fields. This circumstance has caused more than a little confusion in the minds of many, deans and college presidents not excepted. It has also colored the point of view of psychologists toward their own field. Whereas a psychologist or a department some years ago might be branded with one or another of the schools of thought, today we have such diverse titular appendages as psychoacoustical expert, psychotherapist, psychotechnician, psychoneurologist, and sociopsychologist, as well as simple adjective modifiers for complex interrelations with anthropology, education, advertising, engineering, philosophy, business, industry, law, economics, medicine, biology, semantics, speech pathology, child development, and surely several others.

Yet, so far as the academic scene is concerned, the "outside" interests reduce generally to the biological and social science areas. To be sure, psychologists are interested in any and all behavior—economic, religious, political, social, and solitary. Other psychologists, motivated by the potentialities in the economic worth of psychological knowledge and technique as a commodity, or by the urge to render useful service, turn also outward into these diverse areas of human activity but with a performing rather than a discovering frame of reference. The characteristic academic pattern

today is a seeking into biological mechanisms and social pressures for the significant variables in behavior.

Once having left the purely contemplative considerations of mind, the history of psychology shows increasing attention to the behavior of a biological organism. Early attention was devoted to introspective observations of the effects of simple and complex stimulation. Then followed interest in action of muscle and gland in overt response. The function of the nervous system—first as a depository of psychic functions, now as an integrative biological mechanism—has been of continuing interest. Thus, physiology is a science to which psychology must be closely allied. In fact, for many physiologists, and psychologists for that matter, nothing in psychology is worth very much unless it can be considered as a branch of physiology.

Early in the history of modern psychology there was occasional recognition of the fact that the human whose behavior was being studied did not live in isolation as an experimental preparation. His life was a social one and his behavior in relation to his fellowman was important. Wundt in his *Völkerpsychologie* made explicit at least one psychologist's interest in social behavior. And in a passage quoted earlier, Baldwin (5) envisaged psychology becoming a social science before many decades had passed. Today the importance of the social environment for man's experiential history and immediate behavior is generally recognized.

The development of psychology as a science has been such that it must be considered as being both biological and social in its essence. This is not to say that psychology is a liaison activity between biology and sociology, nor merely a convenient bridge between these disciplines. Psychology has its own level of discourse and its own data, which must be dealt with psychologically in the final analysis. Psychology, as Kantor (30) has so well characterized it, is both (a) independent of and (b) homogeneous with these other sciences.

The Academic Dilemma. University administrators are growing accustomed to interscience developments—a filling in of niches. The problem with psychology is that it is seen as a kind of mixed marriage between a science and a not-science, or perhaps between a science and not-quite-a-science, or again as a child marriage where neither party has reached physical maturity, not to mention the age

of consent. There are, of course, no real differences among any of the sciences. All are studying natural phenomena for increased understanding and no one is any more basic than another. There are, on the other hand, superficial differences in regard to age, prestige, wealth, and economic value, as well as perhaps not so superficial differences in precision, although this may well reduce to a question of the irreducible unit for each science and the probabilities obtainable from the N readily available.

In the academic tradition the major reasons for classifying the sciences as we do are (a) historical accident, (b) administrative efficiency, and (c) advisement programing; it is a system which the student (or at least his advisor) can follow in order to give breadth to a liberal arts training. It would probably work just as well to organize sciences around dates of birth, telling students they must choose one from each of the periods 1850–1900, 1800–1850, and so on. In the scheme of things as we realistically face them today, psychology is cut from more than one pattern. Let us see.

At Ohio State and Purdue, we psychologists are in the School of Education. Almost everywhere else we are in Liberal Arts. Usually we consist of a single department, but at Johns Hopkins and Chicago we have in the past been dismembered and boarded out. At Harvard and Columbia we are two-headed creatures without even the benefit of a common circulatory system. At more universities than not, we are a department, but with smaller sibling departments or individuals in schools of medicine, business administration, education, journalism, and others. Even within the Liberal Arts College we may find ourselves under the Division of Sciences, or the Division of Social Sciences, or, in a few deeply traditional cases, with philosophy in the humanities. Some of us are found within the administrative family in Admissions, Student Health, Institutes or Bureaus, or the Dean's Office.

On still another basis of comparison, our courses may be required of all students, elective-at-large, elected as a biological science, elected as a social science, or elected in part for biological science credit and in part for social science credit; and still other patterns are possible. We contribute to survey courses in science, life science, social science, behavioral sciences. We are sometimes called upon to offer beginning courses designed especially for medics, lawyers,

engineers, journalists, nurses, teachers, the neurotic;¹ but not yet for morticians as the English Department at Minnesota was asked to do.

Psychology forms a Section of the American Association for the Advancement of Science, but combines with anthropology to form a Division of the National Research Council. We also "belong" to the Social Science Research Council. NRC's parent, the National Academy of Sciences, has honored only certain kinds of psychologists with membership in its exclusive group, but Sigma Xi considers all psychologists as scientists. The well-known *Fortune* survey (59) of U.S. scientists classifies psychology with the social sciences, but you find people who should know referring to "psychology and the social sciences." Deignan's previously quoted study of research funds includes us as a part of the medical sciences.

And so it goes. In spite of the fact that there are reasonable explanations for each of these situations, our status is confusing. The proper place of psychology on the campus puzzled President Conant of Harvard "as it must have puzzled many university presidents" (67), not to mention persons in many another position of responsibility even less well prepared to evaluate us. As a result of his puzzlement, Conant appointed the Commission which produced, two years later, the Harvard Report on *The Place of Psychology in an Ideal University* (25). Wolfe's recommendation (67) in reviewing the book is still appropriate—"by all means read this book," and get another copy to present to the president of your university.

Among other questions which Conant asked the group of 12 distinguished authorities to consider was "Should we recognize the different types of Psychology by suitable labels on our professorships . . . or should we attempt to have an over-all committee on Psychology . . . ?" In other words, should psychology ideally be allowed to go on spreading out in many directions—possibly even to the point of being dismembered as at Harvard? Should it, as Bentley (7) complains, suffer a "blasting series of . . . Invasions of Learning [from other fields] and Invasions from the Living Scene [applied problems]?" Although many of the Commission's recommendations are punctuated with dissenting footnotes by one or more of its members, they were apparently unanimous in the conclusion that the following would be the case at Ideal U:

The teaching of psychology would be conducted by a single comprehensive department of psychology which would provide a suitable

introductory course, pre-professional training courses, and instructional and research opportunities for graduate students in psychology, and for those who intend to become non-academic practitioners of one or another form of applied psychology. . . . The professional psychologist . . . in a professional school . . . should be related by joint appointment to the community of psychologists in the Faculty of Arts and Sciences (25, p. 30).

Although there are certain problems arising from the traditions this plan would violate, they are not insurmountable. At least one university (Syracuse) has actually effected such a program, combining not only all teaching but psychological service functions as well. Unification of psychology is the obvious goal of the comprehensive department recommendation. The Commission would place psychology in the Liberal Arts College, whether as a social science or otherwise is not stated explicitly. Although more concern is given to the relationships of psychology to the social sciences than to the biological sciences, we do find this intimation that psychology is neither a biological nor a social science:

Psychology has an important role to play as a link between the biological sciences and the social sciences. A required course in psychology without biology, chemistry or physics, and without the social sciences, might give a distorted view of man's place in his natural and social environment, of his reactions, of the stimuli which initiate them, and the mechanisms of behavior (25, p. 28).

In development of this notion, psychology departments may someday find themselves classified, if classification is necessary, as *behavior science*. Our courses may be required of liberal arts candidates in a program of broadly defined goals which are nevertheless better planned than the pick-and-choose sampling characteristic of most arts college requirements today. Since many psychologists have insisted that theirs is a bio-social science, the idea that psychology is neither biological nor social is so novel that the implication for academic organization has been overlooked. Yet it should be obvious that in seeking into the biological and the social for significant independent variables, we do not thereby reduce the dependent variables (in which we are fundamentally interested) to biology or to sociology or to any hyphenated combination thereof. We would extend the comment of the Harvard Commission, just quoted, by saying that required courses in biology, chemistry, or

physics, and/or required courses in the social sciences also give a distorted view of man's place in his natural and social environment, if there is no training in the science of the behavior of the human individual.

PSYCHOLOGY AT MID-CENTURY

We have attempted to present in previous sections and chapters the major issues, problems, and procedures which face those in the field of psychology today. The reader can scarcely have failed to be aware of the frequent allusion to psychology's multifarious character. His training would have been narrow indeed if he had not at least suspected this feature regardless of our efforts to point it out. It is perhaps appropriate that we conclude with one final consideration of the pervading question: what effect does this have on present professional planning and expectations for growth of a science of behavior?

It is not a new question. With every additional development there was probably someone, somewhere, who looked upon it with alarm as a threat to the science. We have seen more concern recently because the growing rate has been greater. We note titles and topics about psychology which read like scare-headlines—dismemberment, cleavage, fission, bifurcation. Sometimes these writers refer to divergencies in research or systems, sometimes to social psychology, or to clinical psychology, or to all kinds of practicing psychologists, or even to physiological psychology, which long ago was supposed to have been swallowed up by physiology. Most of these writers conclude with an optimistic prediction of unity (e.g., 33) or a suggestion for the prevention of disunity (e.g., 34). There is, however, an additional possibility.

Certain issues are not readily solved by deliberation, however wise and sober. It is a fact that some psychologists can converse with physiologists more readily than with certain other psychologists; some talk the language of business and industry; others are medically oriented; still others are motivated by the feeling that psychology has a social mission. Such broad teaching, research, and practice as is now included under the term *psychology* can scarcely avoid being confusing to those who know psychology and even misleading to the public who may come into contact with only a fragment of the whole field.

There are other, even more critical, symptoms of this mid-century stage of development. For example, consider the proposal for a professional practitioner degree in addition to the traditional professional academic degree. The idea was made as an explicit recommendation in the Harvard Report (25) (with some dissent) and later discussed favorably by Guthrie (26). Further comment pro and con has appeared from time to time in the *American Psychologist*. At the very least, the seriousness with which the notion has been considered indicates an acceptance by some that there is a need for official recognition of *kinds* of psychologists—with different activities and different training.

Biology is ahead of psychology in this trend. The term *biological sciences* is a familiar one. Why not, in the future, a broader recognition of the term *behavior sciences* as well? It would be a normal consequence of the growth we have every reason to expect will occur. Biologists have their federated association. APA reorganization in 1945 was a step in the same direction. We submit that there is some point of growth beyond which a single name is unsatisfactory; some point beyond which efforts to maintain unity are as futile as they are harmful; a point which distinguishes the shift from a science to a family of sciences. This stage has not yet been reached in psychology; it may not be reached for some time, but we believe that it is improper and inexcusable to ignore its probability.

It is indeed a healthy organization which is prepared to keep a critical eye upon itself. Such is the duty of the APA Policy and Planning Board. After careful preparation this group announced (2), late in 1952, plans for an intensive three-year research project on the study of psychology as science, as education, and as practice. The proposed program for investigation includes study of many of the topics we have surveyed throughout this book, particularly those discussed in Chapters 10–13. All psychologists who share our concern for professional problems of psychology will not only follow the progress of this unique and ambitious study with keen interest, but will stand ready to assist in its completion. For now we the psychologists become research subjects!

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25. Gregg, Alan (chm.). *The place of psychology in an ideal university*. Cambridge: Harvard University Press, 1947.
26. Guthrie, Edwin R. The status of systematic psychology. *Amer. Psychologist*, 1950, 5, 97-101.
27. Harvard Committee. *General education in a free society*. Cambridge: Harvard University Press, 1945.
28. Hendry, C. E., Lippitt, R., & Zander, A. Reality practice as educational method. *Psychodr. Monogr.*, 1944, No. 9.
29. Henry, E. R. A survey of courses in psychology offered by undergraduate colleges of liberal arts. *Psychol. Bull.*, 1938, 35, 430-435.
30. Kantor, J. R. Preface to interbehavioral psychology. *Psychol. Rec.*, 1942, 5, 173-193.
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32. Keller, Fred S., & Schoenfeld, William N. The psychology curriculum at Columbia College. *Amer. Psychologist*, 1949, 4, 165-172.
33. Klüver, H. Psychology at the beginning of World War II: Meditations on the impending dismemberment of psychology written in 1942. *J. Psychol.*, 1949, 28, 383-410.
34. Krech, D. A note on fission. *Amer. Psychologist*, 1946, 1, 402-404.
35. Lanier, Lyle E. The psychological and social sciences in the national military establishment. *Amer. Psychologist*, 1949, 4, 127-147.
36. McKeachie, W. J. A program for training teachers of psychology. *Amer. Psychologist*, 1951, 6, 119-121.
37. McKeachie, W. J. (ed.). *A review outline of psychology*. Ann Arbor: Wahr Publishing Co., 1951.
38. Manis, Jerome G. Some academic influences on publication productivity. *Soc. Forces*, 1951, 29, 267-272.
39. Marquis, Donald G. Research planning at the frontiers of science. *Amer. Psychologist*, 1948, 3, 430-438.
40. Melton, Arthur W. Military requirements for the systematic study of psychological variables. Symposium Paper on Current Trends in Psychology: Psychology in the World Emergency, University of Pittsburgh, February 15-16, 1952.
41. Milner, Esther. Student preferences concerning teaching method and class structuring. *Amer. Psychologist*, 1948, 3, 233-234. (Abst.)

42. Morlan, George K. Repetition in psychology texts and courses. *J. gen. Psychol.*, 1947, 37, 83-86.
43. Munn, N. L. The first course in psychology. Talk presented at Yale University, November 19, 1947 and published as *A Houghton Mifflin College Bulletin*, April, 1948.
44. Phillips, J. D. Getting total participation. E. Lansing: Adult Education Extension Service, Michigan State College.
45. Pressey, S. L. The place and functions of psychology in undergraduate programs. *Amer. Psychologist*, 1949, 4, 148-150.
46. Raymond Rich Associates. *American foundations and their fields*. (6th ed.) New York: Raymond Rich Associates, 1948.
47. Remmers, H. H. Psychology—some unfinished business. *Psychol. Bull.*, 1944, 41, 713-714.
48. Rogers, Carl C. *Client centered therapy*. Boston: Houghton Mifflin, 1951.
49. Ruja, Harry. Content of the first course in psychology. *Psychol. Bull.*, 1943, 40, 488-496.
50. Ruja, Harry. The order of topics in general psychology. *Amer. Psychologist*, 1948, 3, 199-202.
51. Sanford, F. H., & Fleishman, E. A. A survey of undergraduate psychology courses in American colleges and universities. *Amer. Psychologist*, 1950, 5, 33-37.
52. Schlosberg, H. A laboratory period in the first course in psychology. *Amer. Psychologist*, 1947, 2, 384-387.
53. Seashore, Carl E. (chm.). Report of the committee of the American Psychological Association on the teaching of psychology. *Psychol. Monogr.*, 1910, 12, No. 51.
54. Seidenfeld, Morton A. Professional considerations in organized research. *Amer. Psychologist*, 1949, 4, 410-413.
55. Sibley, Elbridge. *Support for independent scholarship and research*. New York: Social Science Research Council, 1951.
56. Smith, Henry C., & Johnson, Donald. An experimental study of attitudes and achievement in the democratic classroom. *Amer. Psychologist*, 1952, 7, 247-248. (Abst.)
57. Smith, M. Brewster. Psychology in a liberal education. *J. higher Educ.*, 1951, 22, 181-187.
58. Smyth, Henry D. The place of science in a free society. *Amer. Scientist*, 1950, 38, 426-436.
59. Staff of *Fortune*. The scientists. *Fortune*, October, 1948. Also in *Amer. Scientist*, 1949, 37, 107-118.
60. Wangensteen, O. H. Research and the graduate student. *Amer. Scientist*, 1947, 35, 107-113.

61. Webb, Wilse B. The problem of teaching internships. *Amer. Psychologist*, 1952, 7, 20-21.
62. Wechsler, Irving R., & Cogan, Eugene A. Group research projects as a teaching device. *Amer. Psychologist*, 1950, 5, 466. (Abst.)
63. Weitzman, Ellis, & McNamara, Walter J. *Constructing classroom examinations*. Chicago: Science Research Associates, 1949.
64. Wilson, John T. Psychology and the National Science Foundation. *Amer. Psychologist*, 1952, 7, 497-502.
65. Wolffe, Dael. The first course in psychology. *Psychol. Bull.*, 1942, 39, 685-712.
66. Wolffe, Dael. The sensible organization of courses in psychology. *Amer. Psychologist*, 1947, 2, 437-445.
67. Wolffe, Dael. The place of psychology in an ideal university. *Amer. Psychologist*, 1948, 3, 61-64.
68. Wolffe, Dael. (ed.). *Improving undergraduate instruction in psychology*. New York: Macmillan, 1952.

Appendices



APPENDIX A

Annotated List of Reference Books of Value in Psychology

This bibliography includes books and continuations mentioned in the text, and others which, after examination, we feel have a definite reference value for psychologists. The entries are arranged according to broad subject categories which parallel the major classes of *Psychological Abstracts*. Within the several categories the arrangement is alphabetical by author or, in some cases, by title. For most effective use it did not seem desirable to maintain a rigidly consistent order of arrangement.

GENERAL

BIBLIOGRAPHIC GUIDES: TITLES

Books

1. *Cumulative book index; a world list of books in the English language*. New York: Wilson, 1928—. Monthly with semiannual, annual, and biennial cumulations. 5-year permanent volumes: 1928-1932 (1933); 1933-1937 (1938); 1938-1942 (1945); 1943-1948 (1950). (See also next entry.)
2. *United States catalog: books in print, January 1, 1928*. (4th ed.) New York: Wilson, 1928. Earlier editions: 1st, 1899 (1900); 2nd, 1902 (1903); 3rd, 1912 (1912). Each volume lists books in print as of the date, arranged by author, subject, and title. Continued in *Cumulative book index* (1).
3. *Publisher's trade list annual*. New York: Publisher's Weekly, 1873—. A bound collection of publishers' catalogs arranged by company name. Issued annually. Since 1948 has index published separately (4).
4. *Books in print: an author-title-series index to the Publisher's trade list annual*. New York: Bowker, 1948—.
5. U.S. Library of Congress. *A catalog of books represented by Library of Congress printed cards issued to July 31, 1942*. Ann Arbor, Mich.: Edwards Bros., 1942-1946. 167 v.
6. U.S. Library of Congress. *A catalog of books represented by Library of Congress printed cards issued August 1, 1942 to December 31, 1947*. Ann Arbor, Mich.: Edwards Bros., 1948. 42 v.

- L.C. catalog cards, reproduced by photo-offset, are arranged alphabetically by author. All cards issued to the closing dates of the sets in the two preceding entries are included regardless of the date of the book represented by the card.
7. U.S. Library of Congress. *The Library of Congress author catalog: a cumulative list of works represented by Library of Congress printed cards*. Washington: Library of Congress, 1948—. Monthly, with quarterly and annual cumulations. Continues the publication of all L.C. cards with author arrangement started in entries (5) and (6).
 8. U.S. Library of Congress. *The Library of Congress subject catalog*. Washington: Library of Congress, 1950—. This supplement to the author catalog (7) is arranged by subject as classified by the Library of Congress. Quarterly, with annual cumulations.
 9. *Vertical file service catalogue: an annotated subject catalogue of pamphlets*. New York: Wilson, 1, 1935—. Lists independently published pamphlet material, printed or processed, with arrangement by subject. Monthly, except August, with annual cumulations. Vol. 1 is a cumulation for the years 1932-1934; there are no volumes numbered 2 or 3; v. 4, 1935— are the annual cumulations for each year.

Serials

10. Haskell, Daniel C. (comp.). *A check list of cumulative indexes to individual periodicals in the New York Public Library*. New York: Public Library, 1942. Lists subject and author indexes covering three or more volumes of journals in all fields.
11. Haskell, Daniel C., & Brown, Karl. A bibliography of union lists of serials. In *Union list of serials* (15), pp. 3053-3065. Includes published lists of journals having indications of library holdings.
12. Hirshberg, Herbert S., & Melinat, Carl H. *Subject guide to United States Government publications*. Chicago: American Library Association, 1947. Subject indexing is from title of documents and not from any analysis of contents. Does not include psychology as such, but does index a number of pertinent specific topics.
13. *Microcard bulletin*. Middletown, Conn.: Microcard Foundation, No. 1, 1948—. No. 8 (February, 1952) is the third annual consolidated catalog of microcard publications reported by 19 publishers.
14. *Ulrich's periodicals directory: a classified guide to a selected list of current periodicals, foreign and domestic*. (6th ed.) Ed. by Eileen C. Graves. New York: Bowker, 1951. Subject classified list with title and subject index; 91 titles under psychology. Earlier editions were: 1st, 1932; 2nd, 1935; 3rd, 1938; 4th, 1943; 5th, 1947.
15. *Union list of serials in libraries of the United States and Canada*. (2nd ed.) Ed. by Winifred Gregory. New York: Wilson, 1943. Supplement, January 1941-December 1943. New York: Wilson, 1945. Lists 115,000 to 120,000 journals and indicates holdings of more than

600 libraries in the U.S. and Canada. Titles are arranged alphabetically; there is no subject index. Closing date for the 2nd ed. was December 31, 1940. The supplement includes new titles, changes in title, and changes in library holdings. A checking edition for a second supplement was sent to libraries in 1949.

16. U.S. Library of Congress. *Monthly checklist of State publications*. Washington: Library of Congress. 1, 1910—.

Publications of the several states as received by the Library of Congress are listed by states and the department or other issuing agency.

17. U.S. Superintendent of Documents. *United States government publications: monthly catalog*. Washington: Government Printing Office, 1895—.

Lists all federal government documents published by the G.P.O., and all other documents deposited by law in the collection of the Superintendent of Documents. Arrangement is by department or agency.

Dissertations

18. *Dissertation abstracts: a guide to dissertations and monographs available on microfilm*. Ann Arbor, Mich.: University Microfilms, Inc., 1, 1938—.

Published abstracts of dissertations in all fields which have been micro-filmed and are available in that form or in direct reading enlargements. Vol. 1-8, 1938-1951, as *Microfilm abstracts*.

19. *Doctoral dissertations accepted by American universities, 1933/34—*. New York: Wilson. No. 1, 1934—.

Annual. Lists unpublished dissertations and published dissertations with references.

20. Palfrey, Thomas R., & Coleman, Henry E., Jr. *Guide to bibliographies of theses, United States and Canada*. (2nd ed.) Chicago: American Library Association, 1940.

21. U.S. Library of Congress. *List of American doctoral dissertations printed in 1912-1938*. Washington: Government Printing Office, 1913-1940. 26 v.

Lists doctoral dissertations published in the year covered by each annual volume with complete bibliographical reference.

Reference books

22. Hirshberg, Herbert S. *Subject guide to reference books*. Chicago: American Library Association, 1942.

Reference books are classified under 246 alphabetically arranged subject headings.

23. Shores, Louis. *Basic reference books: an introduction to the evaluation, study, and use of reference materials with special emphasis on some 300 titles*. (2nd ed.) Chicago: American Library Association, 1939.

24. Winchell, Constance M. *Guide to reference books*. (7th ed.) Chicago: American Library Association, 1951.

This is the standard work on reference books; entries are arranged in a classified subject arrangement with full bibliographic details and descriptive annotations. Section on Psychology. Earlier editions were the work of Isadore G. Mudge, and the book has long been known simply as "Mudge."

BIBLIOGRAPHIC GUIDES: CONTENTS

Periodical indexes

25. *Annual magazine subject index: a subject index to a selected list of American and English periodicals and society publications, 1907—*. Boston: Faxon. 1, 1908—.
Annual volume. Does not duplicate other periodical indexes, so that lists of journals included varies. General material with emphasis on history, travel, fine arts, and literature. Entries listed by subject only.
26. *Book review digest*. New York: Wilson. 1, 1905—.
A bibliography with excerpts from book reviews published in non-technical magazines for the most part. Monthly with semiannual and annual cumulations. There are subjects and title cumulated indexes for 5-year periods in the annual volumes for 1921, 1926, 1931, 1936, 1941, 1946, 1951.
27. *International index to periodicals devoted chiefly to the humanities and science: a cumulative author and subject index to a selected list of the periodicals of the world, 1907—*. New York: Wilson. 1, 1916—.
Quarterly, with annual cumulations; permanent volume cumulated at 3-year intervals. Includes a number of semitechnical and technical journals in psychology and related fields.
28. *New York Times index*. New York: New York Times. 1, 1913—.
Semiannual, with annual cumulations. Earlier issues varied in the period of publication and cumulation. Of value for material in news stories, editorials, and feature articles; may be useful as a date guide for news stories in other newspapers.
29. *Poole's index to periodical literature, 1802-1881*. (Rev. ed.) Boston: Houghton, 1891, 2 v. Supplements, 5 v., 1882-1907.
The 7 volumes include: v. 1-2, 1802-1891; 1st suppl., 1882-1886; 2nd suppl., 1887-1891; 3rd suppl., 1892-1896; 4th suppl., 1897-1901; 5th suppl., 1902-1906. Major source for nineteenth-century magazine literature. Reprinted in 1938 in 7 volumes by Peter Smith, New York.
30. *Reader's guide to periodical literature, 1900—*. New York: Wilson, 1905—.
Monthly, with quarterly and annual cumulations; permanent cumulations at 3- to 5-year periods. Entries by subject, author, and title in one alphabet.

Bibliographies

31. Besterman, Theodore. *A world bibliography of bibliographies and of bibliographical catalogues, calendars, abstracts, digests, indexes, and the like*. (2nd ed.) London: Author, 1947-1949. 3 v.
Vol. 1-2 contain an alphabetical list by author; vol. 3 is a subject index. Psychology and pertinent specific topics are included.
32. *Bibliographical index; a cumulative bibliography of bibliographies, 1937—*. New York: Wilson. 1, 1938—.
Lists independently published bibliographies and those in books and in over 1,000 periodicals. Quarterly, with annual and 4-year cumulations. The 4-year cumulations are permanent volumes: v. 1, 1937-1942 (1945); v. 2, 1943-1946 (1948); v. 3, 1947-1950 (1951).

DIRECTORIES

33. *Biography index; a cumulative index to biographical material in books and magazines*. New York: Wilson. 1, 1947—.
Quarterly, with annual cumulations. Arranged by biographee, with an index by profession or occupation. Vol. 1 indexes material from 1,300 periodicals to January 1, 1946.
34. *Directory of American scholars*. (2nd ed.) Ed. by Jaques Cattell. Lancaster, Pa.: Science Press, 1951.
Concise biographical sketches of some 20,000 scholars in humanities and social sciences.
35. Feingold, S. Norman. *Scholarships, fellowships and loans*. Boston: Bellman Publishing Co., 1949, 1951. 2 v.
Lists and describes funds available for students in higher education from institutions and agencies other than colleges and universities.
36. *Who knows—and what, among authorities—experts—and the specially informed*. Chicago: Marquis, 1949.
A list of 16,000 individuals with expert knowledge in some 35,000 subject fields.
37. *Who's who in America; a biographical dictionary of notable living men and women*. Chicago: Marquis. 1, 1899—.
Revisions published biennially. Entries give biographical data as supplied by the individual. Names of persons once included which have been dropped primarily because of death are included in *Who was who* issued by the same publisher; vol. 1, 1897–1942 (1942).

DICTIONARIES

38. *Crabb's English synonyms*. (Rev. ed.) Ed. by George Crabb. New York: Harper, 1945.
An alphabetical list of words with synonyms, discussion of meanings, and examples of use.
39. *English-Russian dictionary*. By Vladimir K. Müller. New York: Dutton, 1944. 2 v.
A useful modern dictionary which includes scientific terms.
40. *New complete English-Russian dictionary*. By Louis Segal. London: Humphries, 1948.
Includes terms from the arts, sciences, and technology, and from Russian classical authors.
41. *Roget's international thesaurus*. (Rev. ed.) New York: Crowell, 1946.
The most famous of the word-books, first published in 1852. Entries are arranged according to a classification of knowledge and all words are included in an alphabetical index.
42. *World words*. (2nd ed.) Ed. by W. C. Greet. New York: Columbia University Press, 1948.
Gives pronunciation of 25,000 proper terms including personal names.
43. *What's the name, please?* Ed. by C. E. Funk. New York: Funk & Wagnalls, 1936.
Gives pronunciation of proper names as indicated by some prominent person who bore the name in 1936.

ENCYCLOPEDIAS AND HANDBOOKS

General

44. *American yearbook; a record of events and progress, 1910-1919, 1925—*. New York: Nelson, v. 1, 1929—.
Reports the year's progress with emphasis on U.S. affairs, including the natural and social sciences. Publisher varied previous to 1929.
45. *Americana annual: an encyclopedia of current events*. New York: Encyclopedia Americana Corp., 1923—.
Yearly supplement to the encyclopedia (48), keeping it up-to-date.
46. *Britannica book of the year*. Chicago: Encyclopaedia Britannica, Inc., 1938—.
Yearly supplement to the *Encyclopaedia* (49), keeping it up-to-date.
47. *Columbia encyclopedia*. (2nd ed.) Ed. by William Bridgewater and Elizabeth J. Sherwood. New York: Columbia University Press, 1950.
This one-volume encyclopedia has condensed articles covering materials similar to larger encyclopedias. Very useful for home or office desk use.
48. *Encyclopedia Americana*. New York: Encyclopedia Americana Corp., 1951. 30 v.
This work is especially good for material on United States organizations and institutions, science, and technology. The 30th volume is a detailed subject index.
49. *Encyclopaedia Britannica*. (14th ed.) Chicago: Encyclopaedia Britannica, Inc., 1949. 24 v.
First published in 1768, this encyclopedia has long been considered the standard scholarly reference of its type. Psychology and specific pertinent topics are well treated. The 24th volume contains an excellent and detailed subject index. The 14th edition was first published in 1929; since then there has been a continuous revision policy.
50. *World almanac*. New York: World Telegram, 1868—.
This annual volume provides a wide variety of information on many topics including institutions, organizations, and political, economic, social, and population statistics.

Stylebooks

51. Chicago. University Press. *Manual of style*. (11th ed.) Chicago: University of Chicago Press, 1949.
52. Skillin, Marjorie, & Gay, Robert M. *Words into type*. New York: Appleton-Century-Crofts, 1948.
53. U.S. Government Printing Office. *United States Government Printing Office style manual*. (Rev. ed.) Washington: Government Printing Office, 1945.

GENERAL SCIENCE

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

54. *CADO technical data digest*. Dayton, O.: Document Service Center, Armed Services Technical Information Agency. 1, 1936—.
Monthly. Beginning in 1952, this publication has been classified Restricted and is available only under certain conditions. Contains original

articles, extracts, and abstracts of published material in various fields of research and technology. Recently entitled *Technical data digest*.

55. *International catalogue of scientific literature, 1901-1914*. London: Harrison. 1-14, 1902-1919.

Each annual issue was in 17 volumes, one for each of the fields listed in the text, page 69.

56. *Monthly abstract bulletin*. Rochester, N.Y.: Eastman Kodak Company, 1, 1915—.

Abstracts literature of interest in photography and related material in physics and chemistry. Useful for abstracts of visual material.

57. *OSRD reports: bibliography and index of declassified reports having OSRD numbers*. Ed. by W. Kenneth Lowry. Washington: U.S. Department of Commerce, Office of Technical Services, 1947. (Publ. Bd. no. 7800.)

Lists 2,500 reports according to number, with subject and author indexes.

58. Royal Society of London. *Catalogue of scientific papers, 1800-1900*. London: Clay, 1867-1902; Cambridge: University Press, 1914-1925. 19 v.

Indexes scientific papers published in the nineteenth century as follows: v. 1-6, 1st ser., 1800-1863; v. 7-8, 2nd ser., 1864-1873; v. 9-11, 3rd ser., 1874-1883; v. 12, suppl. vol., 1800-1883; v. 13-19, 4th ser., 1884-1900. Subject index: Cambridge: University Press, 1908-1914. Vol. 1-3 indexed in 4.

59. *Scientific, medical, and technical books published in the United States of America; a selected list of titles in print with annotations*. Ed. by R. R. Hawkins. Prepared for the National Research Council Committee on Bibliography of American Scientific and Technical Books. 1946.

Lists books published after 1930, according to a subject classification, with a description of contents. Psychology has separate chapter. A supplement for books published 1945-1948 was published in 1950.

60. *Technical information pilot*. Washington: Library of Congress, Navy Research Section (ONR contract), 1948—.

Has appeared since January 1948 in unnumbered issues at frequent but irregular intervals. Abstracts unpublished reports, particularly those from Navy research contracts. Cumulated subject indexes published.

61. *Union list of technical periodicals in two hundred libraries of the Science-Technology Group*. Comp. by Elizabeth J. Bowerman for the Special Libraries Association, Science-Technology Group. New York: Special Libraries Association, 1947.

Lists the titles of 5,000 periodicals and indicates holdings of 200 libraries, of which only 13 are in the *Union List of Serials* (15).

62. U.S. Department of Commerce. Office of Technical Services. *Bibliography of technical reports*. Washington. 1, 1946—.

Vol. 1-9, no. 13 (1946-1948) issued weekly; monthly thereafter. Lists with annotations reports from civil and military sources of the U.S. and foreign governments; many are captured enemy documents. A numerical index for the first 10 volumes was published by the Special Libraries Association in 1949.

63. *A world list of scientific periodicals published in the years 1900-1950*. (3rd ed.) Ed. by Wm. Allen Smith and Francis L. Kent. London: Oxford University Press; New York: Academic Press, 1951.

This list of more than 50,000 journals gives standard abbreviations and

holdings of 247 British libraries. Titles are included for journals which are not found in the libraries included.

Literature guides

64. Crane, E. J., & Patterson, A. M. *Guide to the literature of chemistry*. New York: Wiley, 1927.
65. Mellon, M. G. *Chemical publications; their nature and use*. (2nd ed.) New York: McGraw-Hill, 1940.
66. Soule, B. A. *Library guide for the chemist*. New York: McGraw-Hill, 1938.
67. Dalton, Blanche H. *Sources of engineering information*. Berkeley, Calif.: University of California Press, 1948.
68. Parke, Nathan G., III. *Guide to the literature of mathematics and physics including related works on engineering science*. New York: McGraw-Hill, 1947.
69. Roberts, Arthur D. *Guide to technical literature*. London: Grafton, 1939.

DIRECTORIES

70. *American men of science*. (8th ed.) Ed. by Jaques Cattell. Lancaster, Pa.: Science Press, 1949.
Biographical sketches are presented for about 50,000 scientists including psychologists. This standard reference for biographical information about American scientists was founded by a psychologist, James McKeen Cattell.
71. *Chamber's dictionary of scientists*. Ed. by A. V. Howard. New York: Dutton, 1951.
Biographical information on scientists whose names are "frequently encountered in the literature of science." There is a subject index for details in the alphabetically arranged biographies.
72. *Directory of international scientific organizations*. (2nd ed.) Paris: UNESCO, 1952 (New York: Columbia University Press).
Includes descriptions, history, and bibliography of some 200 international scientific organizations.
73. *Handbook of scientific and technical societies and institutions of the United States and Canada*. (5th ed.) Washington: National Research Council, 1948. (Bull. no. 115).
Includes descriptive information on 1,468 societies. Index by activities, purposes, and research funds. Lists current periodicals.

DICTIONARIES

74. *French-English science dictionary*. (2nd ed.) By Louis De Vries. New York: McGraw-Hill, 1951.
75. *German-English science dictionary*. (2nd ed.) By Louis De Vries. New York: McGraw-Hill, 1946.
Both of the De Vries dictionaries are especially designed for the graduate student. Include biology and related sciences, and have about 50,000 entries.
76. *German-English and English-German dictionary for scientists*. By O. W. Leibiger and I. S. Leibiger. Ann Arbor, Mich.: Edwards Bros., 1950.
Includes about 90,000 words.

77. *A German-English technical and scientific dictionary*. By A. Webel. New York: Dutton, 1930.
Includes about 35,000 words.
78. *Russian-English technical and chemical dictionary*. By L. I. Callahan. New York: Wiley, 1947.
Russian to English only. Includes terms from engineering and sciences, including the biological.
79. Holmstrom, J. E. *Bibliography of interlingual scientific and technical dictionaries*. Paris: UNESCO, 1951. (New York: Columbia University Press.)
Lists 1,094 special dictionaries under 224 subject headings. Includes 45 languages.

ENCYCLOPEDIAS AND HANDBOOKS

80. *Handbook of chemistry*. (5th ed.) By N. A. Lange. Sandusky, O.: Handbook Publishers, Inc., 1944.
81. *Handbook of chemistry and physics*. (31st ed.) Ed. by Charles D. Hodgman. Cleveland, O.: Chemical Rubber Publishing Co., 1949.
This standard reference work includes extensive tables of chemical and physical constants, mathematical tables and formulas, and conversion tables and formulas.
82. *Hutchinson's technical and scientific encyclopedia; terms, processes, data in pure and applied science*. New York: Macmillan, 1935-1936. 4 v.
Covers pure and applied science in a classified arrangement with bibliographies. Psychology is not well represented.
83. *An index of mathematical tables*. By A. Fletcher, J. C. P. Miller, & L. Rosenhead. London: Scientific Computing Service Ltd.; New York: McGraw-Hill, 1946.
Encyclopedia treatment of published tables of mathematical functions. Arranged by function types. Bibliography of mathematical tables, pages 373-444.
84. *International critical tables of numerical data, physics, chemistry and technology*. Prepared under the auspices of the National Research Council. New York: McGraw-Hill, 1926-1933. 7 v.
Extensive tables, of which materials in volume 1 on errors of observation and odoriferous substances, and in volumes 5 and 6 on light and acoustics are familiar and useful to psychologists.
85. *International encyclopedia of unified science*. Ed. by Otto Neurath. Chicago: University of Chicago Press, 1938—.
Most of the articles planned for volumes 1 and 2 have appeared in monographic form. The articles are in the field of the philosophy of science and are devoted to "the integration of scientific knowledge."
86. *Van Nostrand's scientific encyclopedia*. (2nd ed.) New York: Van Nostrand, 1947.
Emphasizes applied science and technology. Psychology is not well represented.

GENERAL BIOLOGICAL AND MEDICAL SCIENCES

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

87. *Current list of medical literature*. Washington: Army Medical Library. 1, 1941—.

Monthly list of titles in approximately 1,200 journals received in the Army Medical Library, including most of the major psychological journals. Arrangement is by journal title, by journal issue, and listed in order of the issue table of contents. There are extensive monthly and annual author and subject indexes. Vol. 1-18 (1941-1950) issued weekly.

88. *Index catalogue of the library of the Surgeon General's Office, United States Army*. Washington: Government Printing Office, 1880-[1950]. 57 v. (incomplete).

An index to books, journal articles, and independent publications in the Army Medical Library. In 4 series, each of which covered dates as follows: Ser. 1, A-Z, 1880-1895, 16 v.; ser. 2, A-Z, 1896-1915, 21 v.; ser. 3, A-Z, 1918-1932, 10 v.; ser. 4, A-Metz, v. 1-10, 1936—. The last series has not been, and may not be, completed. The holdings of the library are listed currently in the *Current List of Medical Literature* (87).

89. *Index medicus, a . . . classified index of the current medical literature of the world*. Various publishers, 1879-1927.

A subject index of medical literature published over a long period. [Ser. 1.] v. 1-20, Jan. 1879-Apr. 1899; ser. 2, v. 1-18, 1903-1920; ser. 3, v. 1-12, 1921-1926. Continued in the *Quarterly cumulative index medicus* (91).

90. *Quarterly cumulative index to current medical literature, 1916-1926*. Chicago: American Medical Association, 1917-1927. 12 v.

This subject index overlapped the *Index medicus* (89) for a number of years but in 1927 the two were combined and continued in the *Quarterly cumulative index medicus* (91).

91. *Quarterly cumulative index medicus*. Chicago: American Medical Association. 1, 1927—.

Quarterly, with semiannual permanent cumulations. Subject arrangement with author index. Continues both of the two immediately preceding entries. This index is of great value in psychology, especially for the physiological, clinical, and abnormal areas.

Abstracts

92. *Biological abstracts; a comprehensive abstracting and indexing journal of the world's literature in theoretical and applied biology, exclusive of clinical medicine*. Philadelphia: University of Pennsylvania (Association of American Biological Societies.) 1, 1926—.

Publishes non-critical abstracts in all areas of biological science, arranged in broad classification categories, with extensive volume, author, and subject indexes. The indexes have been delayed in publication by several years after the completion of the volume. Since 1939 the issues

have appeared in 9 sections, of which Section B, basic medical sciences, and H, human biology, are of most direct value to psychologists.

93. *British abstracts*. London: Bureau of Abstracts, 1926—. The title changes of this journal indicate its history: from 1926 to 1937 it was published as *British chemical abstracts*; 1938–1944 as *British chemical and physiological abstracts*; since 1944 under the present title. There are 3 parts: A, pure chemistry; B, applied chemistry; C, analysis and apparatus. Since 1937 Part A has had 3 sections: 1. general inorganic chemistry; 2. organic chemistry; 3. physiology, biochemistry, and anatomy.
94. *Excerpta medica; a complete monthly abstracting service of every article from every medical journal in the world comprising 15 sections and covering the whole field of clinical and experimental medicine*. Amsterdam: Excerpta medica, 1947—. This ambitious title fully describes the ideal of this journal. Section 8, on Neurology and Psychiatry, is of greatest interest in psychology.
95. *Physiological abstracts*. London: Physiological Society (Great Britain). 1–22, no. 9, 1916–1937. In 1937 this journal was combined with British abstracts (93).

Reference books

96. Doe, Janet (ed.). *A handbook of medical library practice*. Chicago: American Library Association, 1943.
97. Smith, Roger C. *Guide to the literature of the zoological sciences*. (Rev. ed.) Minneapolis, Minn.: Burgess Publishing Co., 1945.
98. Wood, Casey A. *Introduction to the literature of vertebrate zoology*. London: Oxford University Press, 1931.

DICTIONARIES

99. *The American illustrated medical dictionary*. (22nd ed.) Ed. by William A. N. Dorland. Philadelphia: Saunders, 1951.
100. *Blakiston's new Gould medical dictionary*. Ed. by H. W. Jones, N. L. Hoerr, & Arthur Osol. Philadelphia: Blakiston, 1949.
101. *Dictionary of scientific terms: pronunciation, derivation, and definition of terms in biology, botany, zoology, anatomy, cytology, embryology, physiology*. (4th ed.) By Isabella F. Henderson & W. D. Henderson. New York: Van Nostrand, 1949.
102. *Pars pro toto: breviarum medicum internationale: abbreviations in international medical literature including sister sciences in six languages*. Ed. by Alfred Peyser. Stockholm: Almqvist & Wiksell, 1950. Abbreviations are arranged alphabetically; terms from German, Danish, English, Spanish, French, Italian, Latin, Swedish.
103. *A source-book of biological names and terms*. (2nd printing.) By Edmund C. Jaeger. Springfield, Ill.: Charles C. Thomas, 1947. An alphabetical list of approximately 12,000 elements from which scientific biological names and terms are made.
104. *Stedman's medical dictionary*. (16th ed.) Ed. by T. L. Stedman & T. G. Stanley. Baltimore: Williams & Wilkins, 1946.

ENCYCLOPEDIAS AND HANDBOOKS

105. *Annual review of physiology*. Stanford, Calif.: Annual Reviews, Inc., 1939—.
An annual publication which includes critical and interpretive reviews of literature on major topics in physiology. Topics of psychological interest include neuropsychology, vision, audition, and physiological psychology. The review articles have extensive bibliographies.
106. Farris, Edmond J. (ed.). *The care and breeding of laboratory animals*. New York: Wiley, 1950.
Valuable information from 15 contributors on common laboratory animals such as the mouse, rat, guinea pig, monkey, and so forth.
107. Glasser, Otto (ed.). *Medical physics*. Chicago: Year Book Publishers, 1944.
Encyclopedic handbook by 200 contributors; useful for descriptions of physiological measurement methods.
108. Griffith, J. Q., & Farris, E. J. (eds.). *The rat in laboratory investigations*. Philadelphia: Lippincott, 1942.
Articles are included on various phases of research using the rat as the experimental organism. Includes a chapter on behavior investigations.

GENERAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographies

109. Conklin, Edmund S. A volume-year check list of psychological and allied journals. *U. Ore. Publ., Psychol. Ser.*, 1931, 1, no. 2, 128 p.
This list of journals gives publishers' addresses as of 1931, and for each title indicates the year or years covered by each volume. Although the list is old, it still is useful for earlier publications.
110. France. Embassy. Washington. Cultural Division. *French bibliographical digest: science; psychology*. New York: Cultural Division of the French Embassy, 1950.
This, the fifth of a series of publications covering several fields, lists books in psychology published in France between 1940 and 1948. For each title there are a description and excerpts from reviews of the book. Includes a list of French psychological journals and societies.
111. *The Harvard list of books in psychology*. Compiled by the Psychologists in Harvard University. Cambridge, Mass.: Harvard University Press, 1949.
An annotated bibliography, classified by major subject areas, of 612 titles of books judged to be the most important to psychology.
112. Louttit, C. M. Bibliography of bibliographies on psychology, 1900–1927. *Bull. Natl. Res. Coun.*, 1928, No. 65.
Has 2,134 entries arranged alphabetically by author with a subject index. Includes bibliographies in books or journal articles published between January 1, 1900, and December 31, 1927.
113. Louttit, C. M. *Handbook of psychological literature*. Bloomington, Ind.: Principia, 1932.
Chapters 3 and 4 of the present book are in part a condensed revision of this earlier work. Appendices include lists of journals in psychology

and related fields, books in series, special psychological libraries, and a bibliography.

114. National Research Council. Division of Anthropology and Psychology. *Revistas de los Estados Unidos en psicología, psiquiatría y campos afines. Nat. Res. Coun. Subcom. Latin Amer. Psychol. Publ.*, no. 1, 1949.
Lists and discusses United States journals in psychology and related fields.
115. Østlyngen, Emil (ed.). *Psykologiske tidsskrifter: liste over ikke-nordiske tidsskrifter av psykologisk interesse pa nordiske biblioteker*. Kobenhavn: Munksgaard, 1951. (Suppl. *Nordisk psykologi*, No. 4.)
Lists 385 journals in psychology and related areas not published in Scandinavian countries, and indicates the holdings of 53 libraries in Norway, Sweden, Denmark, and Finland.
116. *Psychological index, 1894-1935, an annual bibliography of the literature of psychology and cognate subjects*. Princeton, N.J.: Psychological Review Corp., 1894-1936. 42 v.
An annual listing of psychological books and articles arranged in a classification scheme which had variations from year to year. Annual author indexes but no subject indexes. In effect it continues Rand's Bibliography of psychology (117), and is continued in *Psychological abstracts* (126). References for abstracts or reviews of titles included in the annual lists have been published by Ansbacher (123).
117. Rand, Benjamin. *Bibliography of philosophy, psychology, and cognate subjects*. New York: Macmillan, 1905. 2 v.
These volumes form volume 3 of Baldwin's *Dictionary of philosophy and psychology* (138). Entries are arranged by author within a classification scheme. This bibliography is in effect continued for psychological material in the *Psychological index* (116).
118. Rickman, John. *Index psychoanalyticus, 1893-1926*. London: Hogarth Press, 1928.
Includes 4,739 references, in author entries only, of all papers appearing in a designated list of psychoanalytic journals, and of books in this area. It is practically complete for the early and classical literature of psychoanalysis.
119. Schweizerische Philosophische Gesellschaft. *Bibliographie der philosophischen, psychologischen und pädagogischen Literatur in der deutschsprachigen Schweiz, 1900-1940*. Ed. by von E. Heuss, P. Kamm, H. Kunz, & chigen Schweiz, 1900-1940. Ed. by von E. Heuss, P. Kamm, H. Kunz, & M. Landmann. Basel: Verlag für Recht und Gesellschaft, 1944. (The Society's *Jahrbuch*, Beihefte II. Supplement for 1941-1945, edited by Hans Zantop, published in 1945 as the Society's *Jahrbuch* v. 5, separation.)
120. Scott, J. W., & Smith, F. V. A handlist of psychological periodicals in the learned libraries of Great Britain. *J. Documentation*, 1950, 6, 152-166.
List 179 journals in psychology and related fields and indicates holdings of 62 British libraries.
121. Tunnell, Enrica. *A selected list of books and a complete list of periodicals in the psychological library*. Columbia University, New York City. New York: Columbia University, Psychological Library, 1946.
Lists 963 selected book titles classified in major areas.

Abstracts

122. *L'Année psychologique*. Paris. 1, 1894—.

This journal, published annually, contains original papers, and also extensive abstracts of psychological literature.

123. Ansbacher, H. L. (ed.). *Psychological index: abstract references*. Columbus, O.: American Psychological Association, 1940-1941. 2 v.

Included are some 75,000 references to abstracts of 45,000 titles, constituting about 43 per cent of the entries in the *Psychological index*. Vol. 1 covers vol. 1-25, 1894-1918, and Vol. 2 covers vol. 26-35, 1919-1928.

124. *Bulletin analytique. Philosophie*. Paris: Centre National de la Recherche Scientifique. 1, 1947—.

Includes abstracts of psychological literature.

125. *Philosophic abstracts*. New York: Russell F. Moore Co. 1, 1939/1940—. Contents are chiefly review-abstracts of books, arranged by country of publication.

126. *Psychological abstracts*. Washington: American Psychological Association. 1, 1927—.

127. *Psychological book previews*. Princeton, N.J.: Psychological Book Previews. 1, 1951—.

A quarterly journal featuring prepublication author summaries of new books in psychology or with psychological implications. Also includes a bibliography of critical book reviews published in other journals.

Films

128. *Educational film guide*. New York: Wilson, 1936—.

Annual index (with monthly supplements) of films for educational use. Alphabetical title and subject list in part I, and a classified and annotated list in part II. Before 1945 title was *Educational film catalogue*.

129. *Educator's guide to free films*. Randolph, Wis.: Educator's Progress Service, 1941—.

An annual guide arranged by subject areas.

130. *Filmstrip guide*. New York: Wilson, 1948—.

Monthly listing of releases of filmstrips and slides. Annual cumulation.

131. Manoil, A. *Psychological films; annotated guide*. Parkville, Mo.; Park College Press, 1952.

A list of 316 films selected for the usefulness in teaching psychology. Each entry has a descriptive annotation. List of film producers and distributors.

132. *Psychological cinema register*: Catalog 1952. State College, Pa.: Pennsylvania State College, Audio-visual Aids Library, 1951.

A catalog of approximately 238 films for sale or rent. Gives descriptions and information on sales, rental, use, and production. The 1953 *Supplement* lists 41 additional titles.

DIRECTORIES

133. *American Psychological Association [date] directory*. Washington: American Psychological Association, 1916—.

Beginning in 1916, the APA published an annual list of members under

the title *Yearbook*. In 1948 the first *Directory* was published including brief biographical data on members. The second edition of the biographical *Directory* was in 1951. The *Directory* for other years is a list of members with addresses and listing of Divisional memberships, ABEPP Diplomates, the APA Constitution, and other Association data.

134. American Psychological Association. Office of the Executive Secretary. Training facilities and financial assistance for graduate students in psychology: 1953-1954. *Amer. Psychologist*, 1953, 8, 12-41.

A list of stipends and training facilities available in graduate departments of psychology in American universities published in the January number of the *American Psychologist*. Includes 187 departments, with information necessary for making application.

135. Bergman, L. V., & Dallenbach, K. M. Portraits useful to the psychologist. *Amer. J. Psychol.*, 1933, 45, 165-171.

An index to 145 portraits of psychologists appearing in journals and books.

136. Murchison, Carl (ed.). *A history of psychology in autobiography*. Worcester, Mass.: Clark University Press, 1930-1936. 3 v.

Personal, intellectual autobiographies by 43 distinguished psychologists. A valuable and unique primary source to historical material. (Vol. 4 appeared in 1952 under APA auspices.)

137. Murchison, Carl (ed.). *Psychological register*. Worcester, Mass.: Clark University Press, 1929-1932. Vol. 2 and 3.

Volume 3 is a revision and extension of volume 2 and contains biographical sketches and bibliographies of 2,400 psychologists from 40 countries. Volume 1, which was to include persons important in psychology from the Greeks to the early twentieth century, was never published.

DICTIONARIES

English

138. Baldwin, James M. (ed.). *Dictionary of philosophy and psychology*. New York: Macmillan, 1901-1905. 3 v.

Encyclopedic dictionary with scholarly articles on topics and persons important in philosophy and psychology. Though now very old, it still has very great historical importance. Volume 3 is Rand's Bibliography (117). Reprinted in 1940 by Peter Smith, New York.

139. Drever, James. *A dictionary of psychology*. Harmondsworth, Middlesex, England, and Baltimore, Md.: Penguin Books, 1952.

A new and inexpensive dictionary, including about 4,500 terms.

140. English, Horace B. *A student's dictionary of psychological terms*. (4th ed.) Yellow Springs, O.: Antioch Press, 1934.

Includes about 2,000 terms selected for the beginning student and the lay reader.

141. Harriman, P. H. (ed.). *The new dictionary of psychology*. New York: Philosophical Library, 1947.

Brief definitions of about 3,300 terms.

142. Runes, Dagobert D. (ed.). *Dictionary of philosophy*. New York: Philosophical Library, 1942.

Useful for terminology of special schools.

143. Warren, H. C. (ed.). *Dictionary of psychology*. Boston: Houghton Mifflin, 1934.
The standard dictionary of psychology, including definitions of more than 8,500 terms.

Polyglot

144. Academy for the Hebrew Language. *Munahei psikhologia*. Jerusalem: Hebrew Language Academy, 1950. (Mimeo.)
Hebrew equivalents are given for about 1,500 terms from English, French, and German.
145. Duncker, K., & Watt, D. B. *German-English dictionary of psychological terms*. Iowa City, Ia.: Athens Press, 1928.
Includes about 1,300 terms.
146. Hamilton, James A. *English-deutsch für Psychologen*. Frankfurt a. M.: Gaul & Bantelmann, 1931.
English-German only.
147. Luh, C. W. (ed.). *General psychological terms translated into Chinese*. Shanghai: Commercial Press, 1939.
Includes 2,755 terms and an index of Chinese-English equivalents.
148. Ruckmick, C. A. *A German-English dictionary of psychological terms*. Iowa City, Ia.: Athens Press, 1928.
Includes about 1,300 terms.

Foreign language

149. Berka, M., et al. *Kleines psychologisches Lexikon: ein Fachwörterbuch*. Vienna: A. SEXTL, 1949.
150. Giese, Fritz, & Dorsch, Friedrich. *Psychologisches Wörterbuch*. Basel: Benno Schwabe & Co., 1951; Tübingen: Matthiesen & Co. 1950.
This is a new edition of a well-known dictionary first published in 1920. Illustrated.
151. Havin, Henry. *Psykologisk ordbok*. Oslo: Johan Grundt Tanum, 1950.
Includes about 4,000 psychological terms and technical expressions.
152. Piéron, Henri. *Vocabulaire de la psychologie*. Paris: Presses Universitaires de France, 1951.
Includes about 3,700 terms.
153. von Sury, Kurt. *Wörterbuch de Psychologie und ihrer Grenzgebiete*. Basel: Benno Schwabe & Co., 1951.
Includes about 1,800 terms.
154. Warren, H. C. (ed.). *Diccionario de psicologia*. México, D.F.: Fondo de Cultura Economica, 1948.
Translation of Warren's *Dictionary* (143).

ENCYCLOPEDIAS AND HANDBOOKS

155. *Annual review of psychology*. Ed. by Calvin P. Stone. Stanford, Calif.: Annual Reviews, Inc., 1950—.
An annual collection of articles which interpretively review the literature. Authors and some subjects change from year to year. Each article has an extensive bibliography.
156. *Encyclopedia of psychology*. Ed. by P. L. Harriman. New York: Philosophical Library, 1946.

This is the only encyclopedia in psychology, but unfortunately the quality of articles varies widely and the length of articles frequently has little relation to the importance of the subject.

157. *Handbook of applied psychology*. Ed. by Douglas Fryer & Edwin R. Henry. New York: Rinehart, 1950. 2 v.
A collection of encyclopedic articles surveying all aspects of the applications of psychology to a variety of fields and professional problems involved in practice. There are extensive bibliographies.
158. *Psychological atlas*. Ed. by David Katz. New York: Philosophical Library, 1948.
Has 352 illustrations with brief text; 42 portraits of psychologists. Translation of *Psychologischer Atlas; orbis pictus psychologicus*. Basel: Schwabe, 1945.
159. *Publication manual of the American Psychological Association*. Prepared by the Editorial Council of the APA. Washington: American Psychological Association, 1952. (Also in *Psychol. Bull.*, 1952, 49, 389-449.)
This manual is now the standard style manual for all APA publications and should be carefully reviewed before preparing manuscripts for submission to APA journals.

EXPERIMENTAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

160. Andrews, T. G. Some psychological apparatus: a classified bibliography. *Psychol. Monogr.*, 1948, 62, no. 2, 38 p. (Whole no. 289).
Has 942 entries.
161. Chandler, Albert R. *A bibliography of experimental aesthetics, 1865-1932*. Columbus, O.: Ohio State University, 1933.
Mimeographed, 25 pages.
162. McCord, Carey P., & Witheridge, William N. *Odors: physiology and control*. New York: McGraw-Hill, 1949.
Although this is a textbook treatise on odors, it contains an exhaustive 124-page bibliography.
163. Miller, George A., Rosenblith, Walter A., Galambos, Robert, & Hirsh, Ira J. *A bibliography in audition*. Cambridge, Mass.: Harvard University Press, 1950.
Includes about 5,500 author entries with a classified subject index. Approximately 35 per cent of the titles were published earlier than 1938.
164. Richter, Manfred. *Internationale Bibliographie der Farbenlehre und ihrer Grenzgebiete. Nr. 1: Berichtszeit 1940-1949*. Göttingen: "Musterschmidt" Wissenschaftlicher Verlag, 1952.
Includes about 1,675 entries by author, with abstracts of some titles; subject index.
165. Virginia University. *Catalogue of the Adolph Lamb Optical Library*. Charlottesville, Va.: University of Virginia Library, 1947. (*U. Va. Biblio. Ser.*, No. 7.)
This 203-page publication reproduces the catalog cards for a specialized library on all phases of optics, including physiological.
- 165a. *Ophthalmic literature*. London: 1, 1947.—
Quarterly, with volume, author, and subject indexes. Abstracts litera-

ture in clinical and scientific ophthalmology, including a classification for the physiology and psychology of vision.

DICTIONARIES

166. Maerz, Aloyz J., & Paul, M. R. *A dictionary of color*. New York: McGraw-Hill, 1930.
Intended to relate colors with the names by which they are properly identified: 56 color plates with a polyglot, keyed list of color names.
167. Newhall, Sidney, & Brennan, Josephine G. *The ISCC comparative list of color terms*. Washington: Intersociety Color Council, 1949.
A list of visual terms (not color names) with data and indicating similarities and differences between terms used by several societies.

ENCYCLOPEDIAS AND HANDBOOKS

General

168. Munn, Norman L. *Handbook of psychological research on the rat*. Boston: Houghton Mifflin, 1950.
An exhaustive survey of established information organized under traditional psychological categories. Bibliography has 2,500 items.
169. Murchison, Carl (ed.). *Foundations of experimental psychology*. Worcester, Mass.: Clark University Press, 1929.
A collection of articles by different authors presenting critical reviews of specialized fields of psychological experimentation. Although this work has been followed by later review volumes, it is still valuable for information on the early period.
170. Murchison, Carl (ed.). *Handbook of general experimental psychology*. Worcester, Mass.: Clark University Press, 1934.
A successor to the *Foundations* (169) which is still of value in spite of its date.
171. Stevens, S. S. (ed.). *Handbook of experimental psychology*. New York: Wiley, 1951.
A worthy successor to the Murchison handbooks (169, 170). Covers 7 major subject areas in 36 chapters with special emphasis on biological foundations and aspects of psychology. Prepared to "meet the need for a technical survey which would systematize, digest, and appraise the mid-century state of experimental psychology."
172. Warden, C. J., Jenkins, T. N., & Warner, L. H. *Comparative psychology*. New York: Ronald, 1935-1940. 3 v.
An encyclopedic coverage of the literature of animal behavior.

Methods and apparatus

173. Andrews, T. G. (ed.). *Methods of psychology*. New York: Wiley, 1948.
A collection of 22 articles by different authors describing and reviewing methods used in psychology.
174. *Electrical engineer's handbook*. (4th ed.) Ed. by H. Pender and W. A. Del Mar. New York: Wiley, 1949-1950. 2 v.
Volume 2 covers electronic circuits, some of which are important in psychology for bioelectric and auditory research.
175. *Radio amateur's handbook*. West Hartford, Conn.: American Radio Relay League, 1926—.

Annually revised handbook which is an excellent source of information on electronic circuits and principles for the layman.

Statistics

176. Buros, Oscar K. (ed.). *Research and statistical methodology books and reviews 1933-1938*. Highland Park, N.J.: Gryphon Press, 1938. *The second yearbook of research and statistical methodology books and reviews*. Same publisher, 1941. *Statistical methodology reviews, 1941-1950*. New York: Wiley, 1951.
These 3 volumes form a guide (which is expected to continue publication) to the most significant books on statistical methodology published in the period covered. Bibliographical details of books, descriptions, and excerpts from, and references to, book reviews are included.
177. Barlow, Peter. *Barlow's tables of squares, cubes, square roots, cube roots, reciprocals of all integer numbers up to 12,500*. (4th ed.) New York: Chemical Publishing Co., 1941.
178. Dunlap, J. W., & Kurtz, A. K. *Handbook of statistical nomographs, tables and formulas*. Yonkers, N.Y.: World Book Co., 1932.
A collection of basic statistical tables and formulas. The nomographs are especially helpful where rapid estimations of common statistics may be satisfactory.
179. Fisher, R. A., & Yates, F. *Statistical tables for biological, agricultural and medical research*. (3rd ed.) London: Oliver & Boyd, 1947.
Contains 33 standard statistical references, tables and functions, and a section on various constants. Reprinted 1949, New York: Hafner Publ. Co.
180. Kurtz, A. K., & Edgerton, H. A. *Statistical dictionary of terms and symbols*. New York: Wiley, 1939.
Defines and illustrates approximately 200 terms and symbols.
181. Pearson, Karl. *Tables for statisticians and biometricians*. Cambridge: Cambridge University Press, 1914-1939. 2 v.
This classical handbook of statistical tables is still of value, and is a source for frequently reprinted material.
182. Pease, Katherine. *Machine computation of elementary statistics with special reference to the Friden, Marchant, and Monroe calculating machines*. New York: Chartwell House, Inc., 1949.
An easy-to-follow guide to simplified methods of statistical computation using desk calculators.

DEVELOPMENTAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

183. Antonov, A. N. *Physiology and pathology of the newborn; bibliography of the material for the period 1930-1940*. *Monogr. Soc. Rec. Child Developm.*, 1947, 10, no. 2. ix, 217 p.
Contains an estimated 3,000 references arranged alphabetically by author within broad subject classification.
184. *Child development abstracts and bibliography*. (Society for Research in Child Development.) v. 1, 1927—.

- Bimonthly. Arranged in broad subject classification with an author index in each issue, and annual subject and author indexes.
185. *Child welfare films: an international index of films and film strips on the health and welfare of children*. Paris: UNESCO, 1950.
A list of films arranged by country of origin. Available in the U.S. from the Columbia University Press.
 186. Leopold, Werner F. *Bibliography of child language*. Evanston, Ill.: Northwestern University Press, 1952.
A 106-page bibliography of publications up to 1946, arranged by author with a subject index.
 187. Lohr, Inez D. *Motion pictures on child life*. Washington: U.S. Children's Bureau, 1952.
A 54-page list of films classed by subject, with brief annotations, and a directory of distributors.
 188. Shock, Nathan W. *A classified bibliography of gerontology and geriatrics*. Stanford, Calif.: Stanford University Press, 1951.
A bibliography of 18,036 entries, arranged by subject classification and with an author index.
 189. U.S. Children's Bureau. *Research relating to children*. Washington: U.S. Children's Bureau, 1950.
Lists, with descriptive material, research in progress as reported to the Clearinghouse for Research in Child Life between December 1948 and June 1949; 1,600 entries. Supplements have been issued: no. 1, July 1949-March 1950 (1950); no. 2, April-July, 1950 (1951); no. 3, August-December, 1950 (1951); no. 4, January-April, 1951 (1951); no. 5, May-December, 1951 (1952).

DICTIONARY

190. Smith, Anna K. *A glossary of certain child welfare terms in Spanish, Portuguese, French and English*. U.S. Children's Bureau, Publ. no. 271. Washington: Government Printing Office, 1948.
Separate sections are devoted to Spanish-English, English-Spanish, French-English, English-French, Portuguese-English, and English-Portuguese.

ENCYCLOPEDIAS AND HANDBOOKS

191. Carmichael, Leonard (ed.). *Manual of child psychology*. New York: Wiley, 1946.
Articles reviewing the literature on child psychology. Extensive bibliographies.
192. Harms, Ernest (ed.). *The handbook of child guidance*. (2nd ed.) New York: Child Care Publications, 1947.
The 39 chapters by different authors are monographic treatments of special topics.
193. Murchison, Carl (ed.). *A handbook of child psychology*. (2nd ed.) Worcester, Mass.: Clark University Press, 1933.
Has 24 chapters reviewing special topics in child psychology. First edition in 1931. Although Carmichael (191) is a more recent similar volume, this is still useful for earlier literature.

194. Winn, R. W. (ed.). *Encyclopedia of child guidance*. New York: Philosophical Library, 1943.

There are 215 articles, some little more than definitions, others monographic with selected bibliographies.

SOCIAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

195. *Agricultural index; subject index to a selected list of agricultural periodicals and bulletins*. New York: Wilson, 1, 1916—.
Monthly, with periodic cumulations, of which that in September forms an annual volume; 3-year cumulations since 1939. Useful for materials on rural sociology, family life, etc.
196. U.S. Department of Agriculture. Library. *Bibliography of agriculture*. 1, 1942—.
Monthly, with semiannual cumulations; subject and author indexes. Of value especially for social problems, family living, child problems, etc., especially as they relate to rural areas.
197. *Public affairs information service*. New York: Public Affairs Information Service, 1, 1915—.
Weekly, with 5 cumulations per year, the fifth being the permanent annual volume. Selective indexing of over 1,000 periodicals of material in government, economics, sociology, etc.
198. *Social science abstracts; a comprehensive abstracting and indexing journal of the world's periodical literature in the social sciences*. New York: Social Science Abstracts, Inc., Columbia University, 1929-1933. 5 v.
An abstracting service which included sociology, anthropology, social psychology, economics, political science, history, etc. Its short life is very unfortunate. Volumes 1-4 were abstracts for 1929-1932 and volume 5 was a detailed subject and author index.

Bibliographies

199. Comité International Permanent de Linguistes. *Bibliographie linguistique des années 1939-1947*. Utrecht: Spectrum, 1950. 2 v.
Arranged by subject classification.
200. Embree, John F., & Dotson, Lillian O. *Bibliography of the peoples and cultures of mainland Southeast Asia*. New Haven, Conn.: Yale University, Southeast Asia Studies, 1950.
Includes social and cultural material for the region. Has 819 pages plus a 9-page addendum, with entries classified by country, and by subject within the geographic classes.
201. *Inventory of research in racial and cultural studies*. Chicago: University of Chicago, Committee on Education, Training, and Research in Race Relations. 1, 1948—.
Quarterly abstract journal including abstracts of published journal articles and books, and of unpublished research in progress in the broad area of race relations and problems.
202. Miller, M. T. (comp.). *An author, title, and subject check list of Smith-*

sonian Institution publications relating to anthropology. Bull. Univ. N. Mex., bibliogr. Ser., 1946, 1, no. 3 (whole no. 405). 218 p.

Arranged by author with subject index.

203. Otto, Margaret M. *Check-list on current serials in social welfare.* New York: Russell Sage Foundation, 1948. 18 p.
204. Tompkins, Dorothy C. *Methodology of social science research: a bibliography.* Berkeley, Calif.: University of California Press, 1936.

Reference books

205. Burchfield, Laverne. *Student's guide to materials in political science.* New York: Holt, 1935.
206. Childs, Harwood L. *A reference guide to the study of public opinion.* Princeton, N.J.: Princeton University Press, 1934.
207. Coman, Edwin T. *Sources of business information.* New York: Prentice-Hall, 1949.
208. *Guide to historical literature.* New York: Macmillan, 1931.
209. Schattschneider, Elmer, Jones, Victor, & Bailey, S. K. *A guide to the study of public affairs.* New York: Sloane, 1952.

DIRECTORIES

210. *A directory of social science research organizations in universities and colleges.* New York: Social Science Research Council, 1950.
Information on 281 organizations conducting or financing social science research in 104 universities. Includes psychology.
211. *International directory of anthropologists.* (3rd ed.) Ed. by Melville J. Herskovits. Washington: National Research Council and the American Anthropological Association, 1950.
Alphabetically arranged brief biographies of 2,123 professional anthropologists throughout the world.
212. *International directory of opinion and attitude research.* Ed. by Laszlo Radvanyi. México, D.F.: La Ciencias Sociales, 1948.
A directory, with biographical data, of persons engaged in public opinion work. Also lists research organizations and educational institutions.
213. Rosenberg, Herbert H., & Hubbert, Erin. *Opportunities for federally sponsored social science research.* Washington: Syracuse University, Washington Research Office (1785 Massachusetts Ave., N.W.), 1951.
Discusses the kinds of research being supported and methods of securing support for research, and describes the programs in the following divisions of the government: Air Force, Army, Navy, Agriculture, State, Housing & Home Finance, and the National Institutes of Health.

DICTIONARIES

214. *Dictionary of sociology.* Ed. by H. Fairchild. New York: Philosophical Library, 1944.
Brief signed articles giving definitions of sociological terms.
215. *Funk & Wagnalls standard dictionary of folklore, mythology, and legend.* Ed. by Maria Leach. New York: Funk & Wagnalls, 1949-1950. 2 v.
About 4,000 entries and 33 original articles in one alphabet; includes material on cultural factors of interest in psychology.

216. Panunzio, Constantine. *A student's dictionary of sociological terms*. Berkeley, Calif.: University of California Press, 1941.
217. Young, E. F. (ed.). *The dictionary of social welfare*. New York: Interscience Publishers, Inc., 1948.
Terms encountered in social welfare practice, including a number from psychology; classified by fields.

ENCYCLOPEDIAS AND HANDBOOKS

218. *Encyclopedia of religion*. Ed. by Vergilius Ferm. New York: Philosophical Library, 1945.
In addition to religion, articles are included on marriage, divorce, labor movement, etc.
219. *Encyclopedia of religion and ethics*. Ed. by James Hastings. New York: Scribner, 1902-1927. 12 v.
Standard, although old, reference in the area of religion and ethics broadly defined and including articles in social and biological subjects.
220. *Encyclopedia of the social sciences*. Ed. by E. R. Seligman and A. Johnson. New York: Macmillan, 1930-1935. 15 v. (Reprinted 1937 in 8 v.).
Comprehensive coverage of social science fields, prepared under the auspices of 10 learned societies including the APA.
221. *Encyclopedia of superstitions*. By E. Radford. New York: Philosophical Library, 1949.
Describes and gives sources of superstitions, which are classified by key terms.
222. *A handbook of social psychology*. Ed. by Carl Murchison. Worcester, Mass.: Clark University Press, 1935.
Articles emphasizing socialization and social behavior of the individual, with extensive bibliographies.
223. *Public opinion 1935-1946*. Prepared by Mildred Strunk under the editorial direction of Hadley Cantril. Princeton, N.J.: Princeton University Press, 1951.
Data from public opinion polls reported from 16 countries between 1935 and 1946 are presented under alphabetically arranged subject headings.
224. *Social work yearbook, 1951*. New York: American Association of Social Workers, 1951.
This biennial report of activities and developments in the field of social work broadly defined includes a descriptive directory of national public and private social agencies. First published in 1930 by Russell Sage Foundation; the 11th edition was the first issued by the Association.
225. U.S. Dept. of Commerce. *Statistical abstract of the United States*. Washington: Government Printing Office, 1879—.
The standard reference for population, economic, business, social, and political statistics and information for the United States. Includes a guide to other sources of data.

CLINICAL AND COUNSELING PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

226. Buross, Oscar K. (ed.). Educational, psychological, and personality tests of 1933, 1934, and 1935. *Rutgers U. Bull.*, 1936, 13 (1), Stud. Educ. no. 9. 83 p.
227. Buross, Oscar K. (ed.). Educational, psychological, and personality tests of 1936. *Rutgers U. Bull.*, 1937, 14 (2A), Stud. Educ. no. 11. 141 p.
228. Buross, Oscar K. (ed.). *The nineteen thirty eight mental measurements yearbook*. New Brunswick, N.J.: Rutgers University Press, 1938. 415 p.
229. Buross, Oscar K. (ed.). *The nineteen forty mental measurements yearbook*. Highland Park, N.J.: The Mental Measurements Yearbook, 1941. 674 p.
230. Buross, Oscar K. (ed.). *The third mental measurements yearbook*. New Brunswick, N.J.: Rutgers University Press, 1949. 1,047 p.
The preceding 5 items constitute a non-duplicating bibliography of tests for the past 20 years. The first 2 (226, 227) are bibliographies only; the remaining volumes include original critical reviews of tests, and excerpts from published reviews of books on testing. There are 1,684 references in the first 4 volumes and 663 in the fifth. This reference work is an invaluable source of information, including bibliographies in the later volumes, concerning tests of all types. The fourth yearbook is in preparation.
231. *Guidance index*. Chicago: Science Research Associates, 1938—. Monthly, except June, July, and August. An annotated bibliography of articles, books, tests, films, and recordings in the field of guidance broadly defined.
232. *Guide to guidance*. (National Association of Deans of Women.) 1, 1939—. Annual bibliography with abstracts of selected references in the field of educational guidance. Publisher varies; v. 7, 1945—, by Syracuse University Press.
233. *Occupational index*. New York: New York University, 1, 1936—. Quarterly; annual author, title, and subject indexes. Through 1940 issued monthly.
234. *Rehabilitation abstracts*. Washington: Federal Security Agency, Office of Vocational Rehabilitation, 1, 1947—. Bimonthly; entries arranged by classification scheme. Abstracts literature on vocational rehabilitation and related fields.

Bibliographies

235. Goheen, Howard W., & Kavruck, Samuel. *Selected references on test construction, mental test theory, and statistics, 1929-1949*. Washington: Government Printing Office, 1950.
Contains 2,544 references arranged in subject classification with author index. List of journals with abbreviations. Prepared in the Test Development Section of the U.S. Civil Service Commission.
236. Hildreth, Gertrude H. *A bibliography of mental tests and rating scales*. (2nd ed.) New York: Psychological Corporation, 1932.

Has 4,279 references arranged in subject classification with subject and author indexes.

237. Hildreth, Gertrude H. *A bibliography of mental tests and rating scales: 1945 supplement*. New York: Psychological Corporation, 1946.
Supplement to preceding entry, including over 1,000 additional entries.
238. South, Earl Bennett. *An index of periodical literature on testing*. New York: Psychological Corporation, 1937.
A 5,005-item bibliography of selected periodical literature on educational and mental testing, statistical method, and personality measurement for the years 1921 to 1936. Author entries and subject index.

DIRECTORIES

239. American College Personnel Association. *Membership list, 1951-1952 and constitution as amended 1952*. Bloomington, Ind.: Robert Shaffer (Secretary), 1952.
Lists officers, committees, and names and addresses of members.
240. *National Vocational Guidance Association yearbook*. New York: National Vocational Guidance Association, Inc.
Includes constitution of the Association and names and addresses of 4,600 members.
241. National Vocational Guidance Association. Ethical Practices Committee. *Directory of vocational guidance services*. St. Louis, Mo.: NVGA, Ethical Practices Committee, 1951.
Includes title, services, facilities, and other pertinent data about counseling bureaus. Arranged by states.
242. National Committee for Mental Hygiene. *Directory of psychiatric clinics in the United States and other resources, 1948*. New York: National Committee for Mental Hygiene, 1948.
Includes descriptions of clinics, and lists of mental hygiene societies, state institutions, state government departments, and Veterans Administration and other governmental facilities. This is the ninth issue; the first *Directory* appeared in 1920.

DICTIONARIES

243. *Dictionary of occupational titles*. Prepared by the U.S. Employment Service, Division of Standards and Research, Job Analysis and Information Section. Washington: Government Printing Office, 1939-1944. 4 v.
Vol. 1, Definitions of titles; v. 2, Group arrangement of occupational titles and codes; v. 3, Conversion tables; v. 4, Entry-occupational classification.
244. *A dictionary of terms in measurement and guidance*. New York: Psychological Corporation, 1939.
Contains 400 terms with definitions, many by quotation with references.
245. Miller, L. M., & Hunter, G. O. Medical terms used in counseling the handicapped. *Occupations*, 1948, 26, 351-358.
A short, but useful, list of medical terms frequently encountered in this field.
246. *Words for work: handbook of trade terms for a tutoring program for new Americans*. Boston: Jewish Vocational Service of Greater Boston, 1951.
English-German equivalents of terms used in 29 different trades.

ENCYCLOPEDIAS AND HANDBOOKS

247. Bennett, George K., & Cruikshank, R. M. *A Summary of manual and mechanical ability tests*. New York: Psychological Corporation, 1942.
Describes 150 tests with reviews, researches, and bibliographies.
248. Bronner, Augusta F., Healy, Wm., Lowe, Gladys M., & Shimberg, Myron E. *Manual of individual mental tests and testing*. Boston: Little, Brown, 1938.
Includes 126 tests with description, administration directions, norms, interpretation, and references.
249. Kaplan, O. J. (ed.). *Encyclopedia of vocational guidance*. New York: Philosophical Library, 1948. 2 v.
Designed as a desk reference for professional counselors who do not have large library resources.
250. Lindner, Robert M., & Seliger, Robert V. (eds.). *Handbook of correctional psychology*. New York: Philosophical Library, 1947.
Includes 47 articles, a majority of interest in psychology, dealing with the understanding and treatment of individuals under conditions of detention.
251. Wells, F. Lyman, & Ruesch, J. *Mental examiner's handbook*. (2nd ed.) New York: Psychological Corporation, 1945.
Includes informal psychiatric and psychological tests, and some standardized tests for the use of the experienced diagnostician.

ABNORMAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

252. *Bulletin on current literature: the monthly bibliography for workers with the handicapped*. Chicago: National Society for Crippled Children and Adults. 1, 1940—.
A monthly mimeographed abstract journal containing abstracts of articles and books available in the Society's library; arranged by subject classification.
253. *World research in alcoholism*. Chicago: Illinois Department of Public Welfare. 1, 1948—.
Bimonthly journal publishing abstracts of literature in all fields dealing with alcoholism.
254. *Zentralblatt für die gesamte Neurologie und Psychiatrie*. 25, 1921—. (Previous to 1921 was Referate section of *Zeitsch. f. d. ges. Neurol. u. Psychiat.*)
Abstracts of medical literature in these fields and including a section on clinical psychology and psychopathology.

Bibliographies

255. Bunker, H. A. American psychiatric literature during the past 100 years. In J. K. Hall, G. Zilboorg, & H. A. Bunker (eds.), *One hundred years of American psychiatry*. New York: Columbia University Press, 1944.
256. Cabot, P. S. de Q. *Juvenile delinquency; a critical annotated bibliography*. New York: Wilson, 1946.
Contains 973 annotated references from 1914 to 1944.

257. Culver, Dorothy C. *Bibliography of crime and criminal justice, 1927-1931*. New York: Wilson, 1934.
258. Culver, Dorothy C. *Bibliography of crime and criminal justice, 1932-1937*. New York: Wilson, 1939.
259. Elliott, Charles. *Bibliography of stuttering: tentative edition*. Evanston, Ill.: The Book Box, 1951. (Mimeo.)
260. Kuhlman, Augustus F. *A guide to material on crime and criminal justice*. New York: Wilson, 1929.
References to December 30, 1926; continued in Culver (257, 258).
261. Menninger, Karl A., & Devereux, George. *A guide to psychiatric books with a suggested basic reading list*. New York: Grune & Stratton, 1950.
262. New York Academy of Medicine. *Narcotic addiction*. New York: Welfare Council of New York City, 1952.
Has 550 entries for period 1942 to 1952 arranged by subject classification.
263. Pollak, Otto. *Crime causation: selected bibliography of studies in the United States, 1939-1949*. Philadelphia: University of Pennsylvania Press, 1950.
Contains 708 entries arranged by subject classification.
264. Riviere, Maya. *Rehabilitation of the handicapped: a bibliography 1940-1946*. New York: National Council on Rehabilitation, 1949. 2 v.
Includes 5,000 references arranged by author with subject classification code designations. Many entries have abstracts. Author index. Lists of publishers, films, and film sources.

DIRECTORY

265. *Biographical directory of fellows and members of the American Psychiatric Association*. New York: American Psychiatric Association, 1950.
Brief biographical entries for 5,276 names. Includes personal bibliography and war records of members.

DICTIONARIES

266. Fodor, Nandor, & Gaynor, Frank (eds.). *Freud: dictionary of psychoanalysis*. New York: Philosophical Library, 1950.
Gives Freud's own definitions of terms and references to the sources in his writings.
267. Hinsie, L. E., & Shatzky, Jacob. *Psychiatric dictionary with encyclopedic treatment of modern terms*. London: Oxford University Press, 1940.
Pronunciation, explanation, and illustrations given with quotations and references.
268. Hutchings, Richard H. *A psychiatric word book: a lexicon of terms employed in psychiatry and psychoanalysis designed for students of medicine and nursing, and psychiatric social workers*. (7th ed.) Utica, N.Y.: State Hospitals Press, 1943.
Definitions of about 1,400 terms.
269. Kahn, Samuel. *Psychological and neurological definitions and the unconscious*. Boston: Meador, 1940.
Defines about 600 terms from the psychoanalytic point of view, with an extensive bibliography and introductory chapters on psychoanalytic principles.

270. Stone, Calvin P. *Glossary of technical terms for beginning students in abnormal psychology, mental hygiene, and medical social service*. Stanford, Calif.: Stanford University Press, 1944.
About 400 terms with brief, clear definitions.

ENCYCLOPEDIAS AND HANDBOOKS

271. Berger, H. I. *Encyclopedic diagnosis of nervous and mental diseases*. (9th ed.) St. Louis, Mo.: Od Peacock Sultan Co., 1943.
Material on the classical symptomology and terminology of behavior disorders. Alphabetical arrangement of 267 entries, illustrated and indexed.
272. Hunt, J. McVicker (ed.). *Personality and the behavior disorders*. New York: Ronald, 1944. 2 v.
Articles by various authors providing monographic reviews of specific topics in personality and personality deviations.

EDUCATIONAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

273. *Bibliography of research studies in education, 1926/27-1930/40*. Washington: Government Printing Office. v. 1-14, 1929-1942.
Each volume covered an academic year, and was issued as a Bulletin of the U.S. Office of Education.
274. *Education abstracts*. Albany, N.Y. 1-9 no. 9, 1936-1944.
Vol. 1-2 (1936-1937) as *Educational abstracts*.
275. *Education abstracts* (UNESCO). Paris, 1, 1949—.
Vol. 1 as *Fundamental educational abstracts*.
276. *Education index; a cumulative author and subject index to a selected list of educational periodicals, books, and pamphlets*. New York: Wilson, 1, 1929—.
Monthly, with periodic cumulations, including annual and triennial cumulations. Permanent volume 1 is the cumulated volumes for 1929-1931, published in 1932.
277. *Loyola educational digest*. Chicago: Loyola University. 1, 1925—.
Suspended December 1943 with v. 19.
278. *Loyola educational index*. Chicago: Loyola University, 1, 1928.
279. *Review of educational research*. 1, 1931—.
Each issue of this journal is devoted to review articles on a major educational topic. The topics covered are repeated at approximately 3-year periods.

Bibliographies

280. Betts, Emmett A., & Betts, Thelma M. *An index to professional literature on reading and related topics (to January 1, 1943)*. Boston: American Book Co., 1945.
281. Crowley, William H. *The personnel bibliographical index*. Columbus, O.: Ohio State University, 1932.
Annotated references on student personnel with subject and author indexes.

282. Dale, Edgar. *Bibliography of vocabulary studies*. Columbus, O.: Ohio State Univ., Bureau of Educational Research, 1949.
Over 1,800 references arranged according to a subject classification.

Reference books

283. Alexander, C., & Burke, A. J. *How to locate educational information and data*. (3rd ed.) New York: Teachers College, Columbia University, 1950.
284. Good, Carter V. Library resources and documentary research. *Rev. educ. Res.*, 1951, 21, 329-336.
A review of new reference materials and revisions of old works. Similar reviews have appeared at 3-year intervals for some time under varying authorship. Includes psychological materials.

DIRECTORIES

285. *American universities and colleges*. (5th ed.) Washington: American Council on Education, 1948.
Extensive descriptive information of 820 colleges on the ACE approved list. Revised about every 4 years.
286. *A guide to colleges, universities, and professional schools in the United States*. Ed. by Carter V. Good. Washington: American Council on Education, 1945.
In extensive tables information is presented on 3,389 institutions of higher learning including junior colleges.
287. *Leaders in education*. (3rd ed.) Ed. by Jaques Cattell. Lancaster, Pa.: Science Press, 1948.
Brief biographical sketches of about 17,000 American educators.
288. U.S. Office of Education. *Educational directory, 1912—*. Washington: Government Printing Office. 1, 1912—.
An annual publication which gives extensive statistical and directory information on American education at all levels. Since 1931, has appeared in 4 parts: Federal and State educational officers; County and city school officers; Higher education; Educational associations and directories.

DICTIONARIES

289. *Dictionary of education*. Ed. by Carter V. Good. New York: McGraw-Hill, 1945.
Defines about 16,000 terms including foreign words and terms from related fields.
290. *Psykologisk-pedagogisk uppslagsbok*. Ed. by G. Mattsson. Stockholm: Natur och Kultur, 1943.

ENCYCLOPEDIAS AND HANDBOOKS

291. *Cyclopedia of education*. Ed. by Paul Monroe. New York: Macmillan, 1911-1913. 5 v.
Although this well-known and standard reference work is old, it is still of value for historical and biographical purposes.
292. *Encyclopedia of educational research*. (2nd ed.) Ed. by Walter S. Monroe. New York: Macmillan, 1950.
Many extensive review articles with bibliographies, of which a considerable number are of direct interest in psychology.

293. *Encyclopedia of modern education*. Ed. by H. N. Rivlin. New York: Philosophical Library, 1943.

A brief treatment of basic terms, ideas, and movements.

294. *Encyclopedia of sex education; the biological, physiological, psychological, social, legal, and medical aspects of sexual development*. Ed. by Hugo G. Beigel. New York: Stephen Daye Press, 1952.

295. National Society for the Study of Education. *Yearbook*. Chicago: University of Chicago Press, 1902—.

Has appeared each year in 2 volumes which constituted the technical reports of committees on important educational topics. Extensive bibliographies. Many issues are of direct interest in psychology.

INDUSTRIAL PSYCHOLOGY

BIBLIOGRAPHIC GUIDES

Bibliographic indexes

296. *Industrial arts index; subject index to a selected list of engineering, trade and business periodicals, books and pamphlets*. New York: Wilson. 1, 1913—.

Monthly with quarterly and annual cumulations; vols. 7-19 had biennial cumulations. A good source for references in business and industrial psychological material appearing in non-psychological journals.

297. *Industrial training abstracts*. Detroit, Mich.: Wayne University. 1, 1946—. Quarterly. Regularly searches 35 journals. Abstracts classed by subject. Subject and author index in each issue.

Bibliographies

298. Barnes, Ralph M., & Englert, Norma A. *Bibliography of industrial engineering and management literature to January 1, 1946*. (5th ed.) Dubuque, Ia.: W. C. Brown, 1946.

Contains 4,362 items arranged alphabetically by author, with a subject index. Lists 145 journals from which references have been secured.

299. Bray, Charles W. *Final report and bibliography of the Applied Psychology Panel, NDRC*. Washington: U.S. Department of Commerce, Office of Technical Services, 1947. (OSRD Rep. No. 6668; NDRC Appl. Psychol. Panel Rep. No. 740, 1946; Publ. Bd. No. 50833.)

The bibliography includes all unclassified reports on wartime research under the auspices of the Applied Psychology Panel.

300. de Grazia, Alfred. *Human relations in public administration; an annotated bibliography from the fields of anthropology, industrial management, political science, psychology, public administration, and sociology*. Chicago: Public Administration Service, 1949.

Has 363 annotated references.

301. Dorcus, Roy M., & Jones, Margaret H. *Handbook of employee selection*. New York: McGraw-Hill, 1950.

Contains 489 abstracts of criterion studies on the use of tests in the selection of industrial personnel. The studies selected had to meet specifically defined conditions of experimental design; within the definition, the list is complete.

302. Hermans, Thomas G., & Loucks, Roger B. *Annotated bibliography on the psychological aspects of orientation as they relate to aviation*. Univ. Wash., Aviat. Psychol., Rep. no. 1, 1947. (USAF, Air Material Command Engineering Div. Memo. Rep. No. TSEAA-694-16A; U.S. Dept. Commerce, Tech. Serv., Publ. Bd. No. L86499.)
303. Mahler, Walter R. *Twenty years of merit rating, 1926-1946*. New York: Psychological Corporation, 1947.
About 540 annotated references arranged by subject classification with author index.
304. U.S. Dept. of Navy. Special Devices Center. *Bibliography of human engineering reports*. Port Washington, N.Y.: USN Special Devices Center, 1949.
A 9-page list of reports on engineering psychology prepared under Navy auspices.

DICTIONARY

305. Erdelyi, M., & Grossman, F. *Dictionary of terms and expressions of industrial psychology*. New York: Pitman, 1939.
Gives meaning of terms in psychotechnics in English, German, French, and Hungarian.

ENCYCLOPEDIAS AND HANDBOOKS

306. U.S. Dept. of Navy. Special Devices Center. *Handbook of human engineering data*. (2nd ed.) Medford, Mass.: Tufts College, 1951. (Tec. Rep. No. SDC 199-1-2; Nav. Exos. P-643.)
Encyclopedic and tabular summary of experimentally determined human variables related to display and control problems.

APPENDIX B

Bibliography of Journals in Psychology

This bibliography is limited to journals which are specifically psychological as shown by the inclusion of the word in the title, plus a few others which are known from personal examination to be psychological in content. All titles appear in the Union list (A 15) except those with symbols following the entry: (PA) *Psychological Abstracts*; (B) Bolton, H. C., *Catalogue of scientific and technical periodicals*. Washington: Smithsonian Institution, 1885; (SS) Scott and Smith (A 120); and (EO) E. Østlyngen (A 115). Parallel lines (||) following an entry indicate that the journal has stopped publication. The question mark (?) indicates doubt or confusion in the date it follows.

1. Abhandlungen aus dem Gesamtgebiete der Kriminalpsychologie. (Heidelberger Abhandlungen.) Berlin. 1-6, 1912-1936||
2. Abhandlungen zur Philosophie und Psychologie der Religion. Würzburg. 1, 1922-(?).
3. Academia sinica. National Research Institute of Psychology, Peiping.
—Contributions. 1, 1932-(?).
—Monographs. 1, 1932-(?).
4. Acta psychologica. The Hague. 1, 1935—.
5. Acta psychologica, Keijo. (Keijo. Imperial University, Psychological Institute.) Keijo, Japan. 1, 1930-(?).
6. Allgemeines Repertorium für empirische Psychologie und verwandte Wissenschaften. Nürnberg. 1-6, 1792-1801|| (Continued as Neues allgemeines Repertorium . . . v. 5-6, 1799-1801 also entitled Repertorium und Bibliothek für empirische Psychologie, v. 1-2.) (B)
7. American journal of mental deficiency. (American Association on Mental Deficiency.) Albany, N.Y. 45, 1940—. (Supersedes the Association's Proceedings. Takes numbering from Journal of Psychoasthenics, which for v. 22-44, 1918-1940, was a part of the Proceedings.)
8. American journal of psychology. Ithaca. 1, 1887—. (Index 1-30)
9. American journal of psychotherapy. (Association for the Advancement of Psychotherapy.) Lancaster, Pa. 1, 1947—. (PA)
American journal of religious psychology and education. (See Journal of religious psychology.)
10. American Psychological Association.
—Proceedings. 1-2, 1892-1893|| (3-11, 1894-1903, in Psychological

- review, 2-10, 1895-1903; 12-53, 1904-1945 in *Psychological bulletin*; 54, 1946— in *American psychologist*.)
 —Yearbook. 1, 1915—.
11. *American psychologist*; the professional journal of the American Psychological Association, Inc. Lancaster, Pa.; Washington. 1, 1946—. (PA)
 12. *Anales de psicología*. (Sociedad de psicología de Buenos Aires.) Buenos Aires. 1, 1909/1910||
 13. *Anales de psicotécnica*. (Instituto cultural "Joaquín V. González," Rosario. Comisión de información y estudios psicotécnicos.) Rosario, Argentine. 1, 1941-(?).
 14. *Annales de la psychologie zoologique*. Paris. 1-2, 1901-1902||
 15. *L'Année psychologique*. Paris. 1, 1894—.
 16. *Applied psychology monographs*. (American Association for Applied Psychology.) Stanford U., Calif. No. 1-17, 1943-1948|| (Continued in *Psychological monographs*.) (PA)
 17. *Arbeiten zur Entwicklungspsychologie*. Leipzig; Berlin. No. 1-2, 1914-1941||?
 18. *Arbeiten zur Pädagogik und psychologischen Anthropologie*. Langensalza. No. 1, 1939-(?).
 19. *Arbeiten zur Psychologie und Philosophie*. Leipzig. 1, 1920||
 20. *Archiv für angewandte Psychologie*. Berlin. 1-2, 1931||
 21. *Archiv für die gesamte Psychologie*. Leipzig. 1, 1903-(112, no. 1/2, 1943)||? (Continues *Philosophische Studien*. Index 1-50, 51-75 in 75, 76-100.)
 —Ergänzungsband. No. 1-4, 1929-1937||?
 22. *Archiv für die pragmatische Psychologie*. Berlin. 1-3, 1851-1853||
 23. *Archiv für Entwicklungspsychologie*. Leipzig. [3-5, 1921.]
 24. *Archiv für Religionspsychologie und Seelenführung*. Tübingen; Leipzig. 1-5, 1914-1930|| (2-3 in one volume. 1-3 as *Archiv für Religionspsychologie*. None published 1915-1928.)
 25. *Archiv für Völkerpsychologie und Sprachwissenschaft*. Berlin. 1-18, 1861-1888(?).
 26. *Archives de psychologie*. Geneva. 1, 1901—. (Index 1-25 in v. 25.)
 27. *Archives of philosophy, psychology and scientific method*. New York. No. 1-8, 1905-1906|| (Continued as 1, *Archives of philosophy*; 2, *Archives of psychology*.)
 28. *Archives of psychology*. (Columbia University.) New York. No. 1-300, 1906-1945|| (Continues in part *Archives of philosophy, psychology and scientific method*.)
 29. *Archivio de psicología, neurologia e psichiatria*. Milan. 1-20, 1920-1938; ns. 1, 1939—. (Title varies.)
 30. *Archivio italiano di psicologia*. Turin. 1, 1920-(?).
 31. *Archivos argentinos de psicología normal y patología, terapia neuro mental y ciencias afines*. Buenos Aires. 1-2, 1933-1935||(?).
 32. *Arkiv för psykologi och pedagogik*. Upsala; Stockholm. 1-8, 1922-1929|| (Formed by union of *Psyke* and *Svenskt arkiv för pedagogik*.)
 33. *Arquivos brasileiros de psychotecnica*. Rio de Janeiro. 1, 1949—. (PA)

34. Australasian Association of Psychology and Philosophy.
—Monograph series. Sydney. 1-4, 1922-1926||
35. Australasian journal of psychology and philosophy. (Australasian Association of Psychology and Philosophy.) Sydney. 1, 1923—.
36. Australian journal of psychology. 1, 1949—. (PA)
37. Barcelona. Instituto psicotècnic.
—Trabajos. v. 1-4, no. 3, 1933-1936||?
38. Behavior monographs. Cambridge, Mass. 1-4 (no. 1-21.) 1911/1912-1922/1923|| (Superseded by Comparative psychology monographs.)
39. Behaviour: an international journal of comparative ethology. Leiden. 1, 1947—. (PA)
Beiträge zur Analyse der Geschichtswahrnehmungen. (See Psychologische Studien (Berlin).)
40. Beiträge zur Jugendpsychologie. Leipzig. 1-4, 1929-1930||
41. Beiträge zur Massenpsychologie. Halle a.S. No. 1-3, 1928-1929||
42. Beiträge zur Pädagogik und Psychologie. Langensalza. 1-12, 1921-1931||?
43. Beiträge zur pädagogischen Pathopsychologie. Langensalza. 1-3, 1893-1895||?
44. Beiträge zur Psychologie der Aussage. Leipzig. 1-2, 1903-1906|| (Superseded by Zeitschrift für angewandte Psychologie.)
Beiträge zur Psychologie der Zeitwahrnehmung. (See Psychologische Studien (Berlin).)
45. Beiträge zur Psychologie und Philosophie. Leipzig. No. 1-4, 1896-1905||
46. Beiträge zur Philosophie und Psychologie. Stuttgart. 1-11, 1928-1932||
47. Bibliographie der Philosophie und Psychologie. Leipzig. 1, 1920-(?).
48. Bibliothèque de pédagogie et de psychologie. Paris. 1-5, 1898-1903||?
49. Bio-psychology. Bulletin of the Cartesian research devoted to scientific statements concerning biological psychology or bio-psychology. Boston. 1-2, 1924-1926||
50. British journal of educational psychology. (British Psychological Society: Training College Association.) Birmingham. 1, 1931—. (Supersedes Forum of education.)
51. British journal of medical psychology. (British Psychological Society.) London. 1, 1920—. (1-2, no. 4, 1920-1922 as British journal of psychology, Medical section. Index 1-12 in v. 13.)
52. British journal of psychology. (British Psychological Society.)
—General section. London. 1, 1904—. (Index 1-20, 1904-1929.)
—Medical section. (See British journal of medical psychology.)
—Monograph supplements. 1, 1911—.
—Statistical section. 1, 1948—. (PA)
53. British Psychological Society.
—Quarterly bulletin. 1, 1948/1949—. (PA)
54. Buenos Aires. Universidad nacional.
—Facultad de filosofía y letras.
—Instituto de psicología.
—Anales. 1, 1935—.
55. Bulletin of industrial psychology and personnel practice. (Australia, Dept. of Labour and National Service.) Melbourne. 1, 1945—. (PA)

56. Bulletin of military clinical psychologists. Washington. 1, no. 1-3, Apr.-Aug., 1946||? (PA)
57. California. University. Berkeley.
—Publications.
—Psychology, 1, 1910—.
58. California. University. Los Angeles.
—Publications in education, philosophy, and psychology. 1, no. 1-15, 1933-1939||
59. Canadian journal of psychology. (Canadian Psychological Association.) Toronto. 1, 1947—. (PA)
60. Canadian Psychological Association.
—Bulletin. 1-6, no. 3/4, 1940-1946|| (Superseded by Canadian journal of psychology.)
61. Case reports in clinical psychology. (Kings County Hospital.) Brooklyn, N.Y. 1, 1949—. (PA)
62. Catholic University of America.
—Psychological studies. 1-6a, 7, 1904-1923||?
—Studies in psychology and psychiatry. 1, 1926—.
Character and personality. (See Journal of personality.)
63. Charakter: eine Vierteljahresschrift für Psychodiagnostische Studien und verwandte Gebiete. London. 1932|| (German ed. of Character and personality.)
64. Child psychology. London. 1, 1937—. (Continues Institute of Child Psychology, News bulletin, 1936-1937.) (SS)
65. Chinese journal of educational psychology. 1, no. 1-4, 1945||? (PA)
66. Chinese journal of psychology. (Chinese Psychological Association.) 1-4, 1922-1927||? (PA)
67. Chinese journal of psychology. Peiping. 1, no. 1-4, 1936-1937|| (Chinese title: Chung-hua hsin-li hsüeh-pao.)
68. Christchurch (New Zealand) Psychological Society.
—Journal. 1, 1949—. (PA)
Chung-hua hsin-li hsüeh-pao. (See Chinese journal of psychology, 1936-1937.)
69. Clinica psicopedagogica. (Instituto psicopedagogico para niños nervosos.) Buenos Aires. 1-3, no. 1, 1923-1925||
70. Cluj, Rumania. Universitatea.
—Institutul de psihologie experimentală, comparată și aplicată.
—Studii și cercetări psihologice. No. 1, 1929-(?). (See also Revista de psihologie.)
71. Colorado College, Colorado Springs.
—Publications. Education and psychology series. No. 1, 1919||
72. Colorado. University. Boulder.
—Department of psychology and education.
—Investigations. 1-3, no. 2, 1902-1906||
73. Columbia University, New York.
—Contributions to philosophy and psychology. 1-27, 1894-1922||
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74. Comparative psychology monographs. Berkeley and Los Angeles. 1, 1922—.

75. Constitutional psychology series. New York, 1-2, 1940-1942||?
76. Consulting psychologist. (Association of Consulting Psychologists.) New York. 1-2, no. 7, 1934-1936|| (Superseded by Journal of consulting psychology.)
77. Deutsche Gesellschaft für Psychologie. Bericht über den . . . Kongress der Deutschen Gesellschaft für Psychologie. Leipzig. 1, 1904—. (1-11, 1904-1929 as Kongress für experimentelle Psychologie, Bericht. 1904-1928 as Gesellschaft für experimentelle Psychologie, which should not be confused with association of same title founded 1888.)
78. Deutsche Psychologie. Langensalza, 1-7, no. 4, 1916-1932|| (Vol. 6, no. 2-6 never published. Subtitle varies.)
79. Duke University, Durham, N.C.
—Contributions to psychological theory. 1, 1934—. (Supersedes Duke University psychological monographs)
—Duke University psychological monographs. 1, 1931-1934||
80. Educational and psychological measurements. (Science Research Associates.) Chicago. 1, 1941—.
81. Educational psychology monographs. New York; Baltimore. 1, 1910—. (1-5 lack numbering.)
82. Egyptian journal of psychology. (Society of Integrative Psychology.) Cairo. 1, 1945—. (PA)
83. Enfance: psychologie, pédagogie, neuro-psychiatrie, sociologie. Paris. 1, 1948—. (PA)
84. Erziehungswissenschaftliche und psychologische Studien. Hamburg. 1, 1931-(P). (1-7, 1931-1938 as Erziehungswissenschaftliche Studien.)
85. Études de psychologie. Louvain. 1-3, 1912-1934||?
86. Études de psychologie et de philosophie. Paris. 1, 1939—. (EO)
87. Florence. Università.
—Ricerche di psicologia. 1-2, 1905-1907||?
88. Fortschritte der Psychologie und ihrer Anwendungen. Leipzig; Berlin. 1-5, no. 6, 1912-1922||
89. Forschungen zur Völkerpsychologie und Soziologie. Leipzig. 1-14, 1925-1935||
90. Genetic psychology monographs. Provincetown, Mass. 1, 1926—.
91. Gesellschaft, Sammlung sozialpsychologischer Monographien. Frankfurt a.M. 1-40, 1905-1912||
92. Gesellschaft für Experimental-psychologie, Berlin.
—Schriften. Leipzig. 1-4, 1890||
93. Gesellschaft für psychologische Forschung. Leipzig.
—Schriften. 1-20, 1891-1916||
94. Gesellschaft für Tierpsychologie. Stuttgart.
—Mitteilungen. 1-4, 1913-1916; ns. no. 1-5, 1920-1924; s3, no. 1-4, 1927-1929; s4, no. 1-2, 1930-1934||? (Index 1913-1920 in ns. no. 4.)
95. Gnôthi sauton, oder, Magazin sur Eifahrungszeelenkunde als ein Lesebuch für Gelehrte und Ungelehrte. Berlin. 1-10, 1783-1793|| (Superseded by Psychologisches Magazin.)
96. Group psychotherapy. Beacon, N.Y. 1, 1947—. (1-2, 1947-1949 as Society.) (PA)

97. Hamburger Untersuchungen zur Jugend- und Sozial-psychologie. Leipzig. No. 1-5, 1929-1933|| (Beihefte zur Zeitschrift für angewandte Psychologie, no. 45-56, 60, 66-67.)
98. Harvard University, Cambridge, Mass.
—Psychological laboratory.
—Psychological studies. 1-5, 1903-1922||
99. Hsin li chiao yü shih yen chuan p'ien. (National Central University.) Nanking. 1, no. 1-2, F-Mr, 1934||? (English title: Monograph of psychology and education.)
100. Hsin li pan nien k'an. (National Central University.) Nanking. 1, 1934-? (English title: National central journal of psychology.)
Human factor. (See Occupational psychology.)
101. Human relations; studies towards the integration of the social sciences. London. 1, 1947—. (PA)
102. R. Hungarian Petrus Pázmány University.
—Psychological Laboratory.
—Psychological studies. 1, 1937—. (EO)
103. Indian journal of psychology. (Calcutta University Press.) Calcutta. 1, 1926—.
104. Indiana Association of Clinical Psychologists.
—IACP News. 1, 1939—.
105. Industrial psychology monthly. Hamilton, N.Y. 1-3, 1926-1928||
106. Industrielle Psychotechnik. Berlin. 1, 1924-(?).
107. Institut für experimentelle Pädagogik und Psychologie des Leipziger Lehrervereins.
—Pädagogisch-psychologische Arbeiten. 1-20, no. 2, 1910-1933||? (1-9 as Veröffentlichungen.)
108. Institut général psychologique, Paris.
—Bulletin. 1-33, no. 1/6, 1900-1933||
Mémoires. no. 1-4, 1905-1911||?
109. Institutet för psykologisk forskning, Upsala.
—Meddelanden. 1-7, 1910-1916|| (Supplement of Psyke.)
110. Instituto psicopedagógico nacional. Lima, Peru.
—Bolétin. 1, 1942—.
111. Intercollegiate Psychology Association. New York.
—Journal. 1, 1949—. (PA)
112. International journal of opinion and attitude research. (Mexico, University, Institute for Studies in Social Psychology and Public Opinion.) Mexico City. 1, 1947—. (PA)
113. Iowa. University.
—Studies in psychology. 1, 1897—. (v. 4— in Psychological monographs.)
114. Japanese journal of educational psychology. Tokyo. 1, 1926-(?).
115. Japanese journal of experimental psychology. (Kyoto. Association of Experimental Psychology.) Kyoto. 1, 1934-(?).
116. Japanese journal of psychology. (Tokyo, Imperial University; Japanese Psychological Association.) Tokyo. 1-3, no. 4, 1923-1925; ns. 1, 1926—.

117. Jenaer Beiträge zur Jugend- und Erziehungspsychologie. Langensalza. 1-12, 1926-1929|| (EO)
118. Jeugd en Beroep; tijdschrift voor jeugdpsychologie, voorlichting bij beroepskeuze en beroepsvorming. (Vereeniging tot bevordering der voorlichting bij beroepskeuze.) Purmerend. 1, 1928-(?).
119. Johns Hopkins University, Baltimore.
—Studies in philosophy and psychology. 1-3, 1908-1909||
120. Journal de psihotehnica. Bucuresti. 1, 1937—. (EO)
121. Journal de psychologie normale et pathologique. Paris. 1, 1904—. (Suspended 1918-1919. 13-16 never published.)
122. Journal für Psychologie und Neurologie. (Berlin. Universität. Neurobiologisches Institut: Kaiser Wilhelm Institut für Hirnforschung.) 1, 1902—.
123. Journal of abnormal and social psychology. (American Psychological Association.) Albany, N.Y. 1, 1906—. (1-15, 1906-1921 as Journal of abnormal psychology.)
124. Journal of animal behavior. Cambridge, Mass.; New York. 1-7, 1911-1917|| (Continued by Psychobiology.)
125. Journal of applied psychology. (American Psychological Association.) Baltimore; Washington. 1, 1917—.
126. Journal of clinical psychology. Burlington, Vt. 1, 1945—.
—Monograph supplements. (Included in regular issues and reprinted.)
127. Journal of comparative and physiological psychology. (American Psychological Association.) Baltimore; Washington. 1, 1921—. (1-39, 1921-1946 as Journal of comparative psychology. Continues Psychobiology.)
128. Journal of comparative neurology and psychology. Philadelphia. v. 14-20, 1904-1910 of Journal of comparative neurology.
129. Journal of consulting psychology. (American Psychological Association.) Washington. 1, 1937—. (Supersedes Consulting psychologist.)
Journal of delinquency. (See Journal of juvenile research.)
130. Journal of education and psychology. Baroda, India. 1, 1942(?)—. (PA)
131. Journal of educational psychology. Baltimore. 1, 1910—.
132. Journal of experimental psychology. (American Psychological Association.) Washington. 1, 1916—. (Suspended 1918-1919.)
133. Journal of general psychology. Provincetown, Mass. 1, 1928—.
Journal of genetic psychology. (See Pedagogical seminary and)
134. Journal of juvenile research. Whittier, Calif. 1-22, no. 3/4, 1916-1938|| (Suspended 1924. 1-12, no. 2, 1916-1928 as Journal of delinquency.)
135. Journal of parapsychology. Durham, N.C. 1, 1937—.
136. Journal of personality. Durham, N.C. 1, 1932—. (1-13, 1932-1945 as Character and personality.)
137. Journal of philosophy, psychology, and scientific method. 1-17, 1904-1920|| (Continued as J. philosophy.)
138. Journal of projective techniques. (Rorschach Institute.) New York. 1, 1936—. (1-13, 1936-1949 as Rorschach research exchange.)
139. Journal of psychoasthenics. (Association of American Institutions for

- Feeble-minded.) Faribault, Minn. 1-22, 1896-1918|| (v. 23-44, 1919-1940 in American Association for the Study of the Feeble-minded (later Amer. Assoc. Ment. Def.) Proceedings. See American journal of mental deficiency. Index 1-5, 6-10, 15-20.)
140. Journal of psychology. Provincetown, Mass. 1, 1935/1936—.
141. Journal of social issues. (Society for the Psychological Study of Social Issues.) New York. 1, 1945—. (PA)
142. Journal of religious psychology, including its anthropological and sociological aspects. Worcester, Mass. 1-7, 1904-1915|| (1-4, 1904-1911 as American journal of religious psychology and education.)
—Monographs. 1-2, 1906-1907||?
143. Journal of social psychology; political, racial and differential psychology. Provincetown, Mass. 1, 1930—.
144. Kansas. Fort Hayes Kansas State College.
—Studies. Psychology series. 1, 1940—.
145. Kansas. University.
—Studies in psychology. no. 1, 1937||?
146. Karlsruhe. Technische Hochschule.
—Institut für Sozialpsychologie.
—Sozialpsychologische Forschung. 1-2, 1922||
147. Keijo Imperial University. Tokyo.
—Studies in philosophy and psychology. 1, 1926-(?).
148. Kwartalnik psychologiczny. (Poznanskie Towarzystwo Psychologiczne.) Poznan. 1, 1930—.
149. Leipzig. Staatliche Forschungsinstitute.
—Forschungsinstitut für Psychologie.
—Abhandlungen. 1, 1916-(?). (1-5 as Veröffentlichungen.)
150. L'élektani tanylmányok. 3, 1939—. (Hungarian; Psychological studies.) (EO)
151. London. University.
—University College.
—Psychological laboratory. Collected papers. 1, 1912-(?).
152. Louvain. Université Catholique.
—Laboratoire de psychologie expérimentale.
—Travaux. 1, no. 1-2, 1905-1910||?
153. Lux. Bollettino dell' accademia internazionale per gli studi psicologia. Rome. 1, 1888-(?). (B)
Magazin zur Erfahrungs Seelenkunde. (See Gnóthi sauton, etc.)
154. Mendoza (city). Argentine. Universidad nacional de Cuyo.
—Instituto de psicología experimental.
—Publicaciones. 1, 1943-(?).
155. Menneske og Milij. Copenhagen. 1, 1946—. (PA)
156. Mensch und Welt; Berner Abhandlungen zur Psychologie und Pädagogik. Bern. [5, 1939].
157. Mental measurement monographs. Baltimore. No. 1-11, 1925?-1936||
158. Mentsh vissenshaft. 1, no. 1-2/3, 1930-1931||? (English title: Psychological science of man.)
159. Mind; a quarterly review of psychology and philosophy. London; etc.

- 1-16, 1876-1891; ns. 1, 1892—. (Index 1-16 in 16, ns. v. 1-12, 13-32, 33-42.)
160. Monographien zur Ethnopsychologie. Neubrandenburg. 1, 1931||
161. Montevideo. Laboratorio de Psicopedagogia "Sebastian Morey Otero."
—Boletin. 1, 1943-(?). (PA)
162. Moscow. Gosudarstvennii institut muzykal'noi nauki.
—Fiziologo-psikhologicheskaya sektsiya.
—Sbornik rabot. 1, 1925||
Gosudarstvennyi institut psikhologii.
—Refleksy, instinkty i navyki . . . psikhologicheskie issledovaniia . . . 1, 1935—.
Universitet.
—Psikhologicheskaya laboratoriya.
—Zapiski. 1-5, 1896||
—Psikhologicheskoe obshchestvo.
—Trudy. [1888-1890?]
163. Motor skills research exchange. Louisville, Ky. 1, 1949—. (PA)
(Title changed to: Perceptual and motor skills research exchange. 4, no. 1, 1952.)
164. Muenchener Studien zur Psychologie und Philosophie. Stuttgart. No. 1-5, 1914-1920||
165. Munich. Universität.
—Psychologischen Institut.
—Arbeiten. 1-10, 1916-1929; [s2] 1, 1930—? (Index v. 1-10.)
National central journal of psychology. (See Hsin li pan nien k'an.)
166. National Institute of Industrial Psychology. London.
—Journal. (see Occupational psychology.)
NIIP news. 1937—.
—Report. No. 1, 1926—.
167. Nederlands tijdschrift voor psychologie. 1-10, 1933-1942||?; 1, 1947/1948—.
168. Nervous child. Quarterly journal of psychopathology, psychotherapy, mental hygiene and guidance of the child. New York. 1, 1941—.
169. Neudrucke zur Psychologie. Langensalza. 1-3, 1917-1918||
170. Neue psychologische Studien. (Leipzig. Staatliche Forschungsinstitute. Forschungsinstitut für Psychologie.) Munich. 1-15. no. 2, 1926-1939||
(Supersedes Psychologische Studien (Wundt).)
171. Neues allgemeines Repertorium für empirische Psychologie und verwandte Wissenschaften. Nürnberg. 1-2, 1802-1803|| (Continues Allgemeines Repertorium. . . .) (B)
172. Nordisk psykologi. Lyngby, Denmark. 1, 1949—. (PA)
173. North Dakota. University. Grand Forks.
—Art psychology bulletin. no. 1-4, 1922-1926|| (1-2 as Art bulletin.)
174. Obozriene psikiatrii, nevrologii i eksperimental'noi psikhologii. Petrograd. 1-19, 1896-1914||?
175. Obozrenie psikiatrii, nevrologii i refleksologii. Leningrad. 1-4, no. 5, 1926-1929||?
176. Obshchestvo eksperimental'noi psikhologii.
—Protokoly. St. Petersburg. [1900-1901].

177. Occupational psychology. (National Institute of Industrial Psychology.) London. 1, 1922—. (1-5, 1922-1931 as the Institute's Journal; 6-11, 1932-1937 as Human factor. Index: 1-4, 1922-1929 in v. 4, 5-11, 1930-1937 in v. 11.)
178. Ohio State University. Columbus.
—Contributions in psychology. No. 1-12, 1904-1934|| (1-4 as Studies in psychology (Reprinted from Psychological review); 5 as Psychological studies (Psychological monographs, no. 4/5); 6, 1922 called (ns.) no. 1.)
179. Oregon. University. Eugene.
—Studies in psychology. 1, no. 1-7, 1929-1935|| (v. 1, no. 1-3 as Publications, Psychology series.)
—University of Oregon monographs.
—Studies in psychology. No. 1, 1943—.
180. Pädagogisch-psychologische Arbeiten. (Institut für experimentelle Pädagogik und Psychologie des Leipziger Lehrervereins.) 1-20, no. 2, 1910-1933||?
181. Pädagogisch-psychologische Studien. Leipzig. 1-23, 1900-1922||
182. Pädagogische Psychologie und Physiologie. 1-8, 1898-1905||?
183. Paris. École de psychologie.
—Bulletin de l'École de Psychologie et de la Société de Psychothérapie. 1, 1935—. (Supersedes Revue de psychothérapie et de psychologie appliquée.)
184. Paris. Hospice de la Salpêtrière.
—Laboratoire de psychologie.
—Travaux. 1-10, 1898-1928||
185. Paris. University. Groupe d'Études de Psychologie.
—Bulletin. 1, 1950—. (PA)
186. Pastoral psychology. Great Neck, N.Y. 1, 1950—. (PA)
187. Pedagogical seminary and journal of genetic psychology. Provincetown, Mass. 1, 1891—. (1-34, 1891-1924 as Pedagogical seminary; a quarterly international record of educational literature, institutions and progress.)
188. Peiping, China.
—National Tsing Hua University.
—Science reports. Ser. B. Biological and psychological sciences. 1, 1931-(?).
189. Pennsylvania. University. Philadelphia.
—Experimental studies in psychology and pedagogy. 1-9, 1902-1922||
190. Persona: the intercollegiate journal of psychology. Cleveland, O. 1, 1949—. (PA)
191. Personnel psychology; a journal of applied research. Washington. 1, 1948—. (PA)
192. Phare de Normandie. Revue d'études psychologiques. Rouen. 1892-(?). (B)
193. Philosophie, Psychologie, Pädagogik monatlicher Anzeiger. Leipzig. 1-19, no. 11, 1925-1943|| (EO)
Polskie archiwum psychologii. (See Psychologia wychowawcza.)
194. Prace z psychologii doświadczalnej. Warsaw. 1, 1913||?

195. Practical psychologist. (Federation of Practical Psychology Clubs of Great Britain.) London. 1-2, 1925-1926||?
196. Praktische Psychologie. Leipzig. 1-4, 1919-1923||
197. Princeton University, Princeton, N.J.
—Contributions to psychology. 1-4, 1895-1909|| (Reprints)
198. Psiche; rivista di studi psicologici. Florence. 1-4, 1912-1915||
199. Psicotécnia. Madrid. 1, no. 1-2, 1939-1940||
200. Psikhiairiia, nevrologiia i éksperimental'naia psikhologiia. (Obshchestvo Psikhiatrov i Nevropatologov v Petrograd.) Petrograd. 1-2, 1922||?
Psikhofiziologiia trudy i psikhotekhnika. Moscow. (See Sovetskaia psikhotekhnika)
201. Psikhologiia. Moscow; Leningrad. 1-5, no. 4, 1928-1932|| (1 as Zhurnal psikhologii, pedagogii i psikhotekhniki, Serii A.)
Psikhotekhnika i psikhofiziologiia truda. (See Sovetskaia psikhotekhnika.)
202. Psyché. Paris. 1, 1946—. (PA)
203. Psyche: an annual of general and linguistic psychology. London; Cambridge. 1, 1920—. (1, 1920-1921 as Psychic research quarterly: 2-12, 1921-1932 as Psyche: a quarterly review of psychology.)
204. Psychobiology. Baltimore. 1-2, 1917-1920|| (Continues Journal of animal behavior. Continued in Journal of comparative psychology.)
205. Psychologia wychowawcza. (Zwiazek polskiego nauczycielstwa szkół powszechnych.) Warsaw. 1-11, no. 4. 1926-1939||? (1-10, 1926-1938 as Polskie archiwum psychologii.)
206. Psychological abstracts. (American Psychological Association.) Lancaster, Pa.; Washington. 1, 1927—.
207. Psychological book previews. Princeton, N.J. 1-2, no. 3, 1951-1952|| (PA)
208. Psychological bulletin. (American Psychological Association.) Lancaster, Pa.; Washington. 1, 1904—.
209. Psychological clinic. Philadelphia. 1-23, no. 2, 1907-1935||
210. Psychological exchange. New York. 1-5, no. 1, 1932-1936||
211. Psychological index . . . an annual bibliography of the literature of psychology and cognate subjects. (American Psychological Association.) Lancaster, Pa. 1-42, 1894-1935||
212. Psychological monographs: general and applied. (American Psychological Association.) Lancaster, Pa.; Washington. 1, 1895—. (1-5, 1895-1913 as Psychological review; monograph supplement; v. 6-61, no. 6, 1914-1947 as Psychological monographs.)
213. Psychological Museum, Chicago.
—Topics. 1, no. 1-3, 1937-1938||?
214. Psychological record. Bloomington, Ind. 1-5, 1937-1945||?
215. Psychological review. London. 1-6, no. 2, 1878-1883||
216. Psychological review. (American Psychological Association.) Lancaster, Pa.; Washington. 1, 1894—.
Psychological science of man. (See Mentsh vissenshaft.)
217. Psychological Service Center, Washington, D.C.
—Journal. 1, 1949—. (PA)

218. Psychological Society of Great Britain.
—Proceedings. 1, 1875/1879||
219. Psychological studies; from the Psychological Laboratory, Maharaja's College, Mysore. 1, 1926||
220. Psychologický sborník. Bratislava. 1, 1946—. (PA)
221. Psychologie appliquée. Paris. 1-3, 1920-1921|| (Merged with *Revue de psychothérapie et de psychologie appliquée.*)
222. Psychologie et le vie. Paris. 1, 1927-(?).
223. Psychologie in Einzeldarstellungen. Heidelberg. 1-7, 1909-1913|| (3 publ. in 1924).
224. Psychologische Abhandlungen. (Jung.) Leipzig. 1-4, 1914-1934||?
225. Psychologische Abhandlungen. Zurich/Leipzig. 2-7, 1939-1950-? (EO)
226. Psychologische achtergronden. Groningen. 1, 1950—. (PA)
227. Psychologische Arbeiten. Leipzig. 1-9, 1895-1928|| (Suspended, 1915-1920.)
228. Psychologische bibliotheek. (Nederlandsche Psychologische Vereeniging.) Amsterdam. 1, 1897||?
229. Psychologische Forschung. Berlin. 1-22, 1921-1938||?
230. Psychologische Forschungen über den Lebenslauf. Vienna. 1, 1937||?
231. Psychologische Mongraphien. Leipzig. 1-5, 1926-1933||
232. Psychologische Praxis. Schriftenreihe für Erziehung und Jungendpflege. Basel. No. 1, 1943—.
233. Psychologische Rundschau; schweizerische Monatsschrift für das Gesamtgebiet der modernen Psychologie. Basel. 1-4, 1929-1933||
234. Psychologische Studien. (Wundt.) Leipzig. 1-10, 1905-1918|| (Continues *Philosophische Studien.* Continued as *Neue psychologische Studien.*)
235. Psychologische Studien. (Berlin, Universität, Psychologisches Institut.)
—Abteilung 1. Beiträge zur Analyse der Geschichtswahrnehmungen. 1-7, 1904-1923||
—Abteilung 2. Beiträge zur Psychologie der Zeitwahrnehmung. 1, 1904||
236. Psychologische Untersuchungen. (Lipps.) Leipzig. 1-2, no. 3, 1905-1913||
237. Psychologisches Magazin. Jena; Altenburg. 1-3, 1796-1798|| (Continues *Magazin zur Erfahrungsseelenkunde.*)
238. Psychologist. London. 1, 1933-(?).
239. Psychologists' League Journal. New York. 1-5, 1937-1942||?
240. Psychometric monographs. (Psychometric Society.) Chicago. no. 1, 1938—.
241. Psychometrika; a journal devoted to the development of psychology as a quantitative rational science. (Psychometric Society.) Chicago. 1, 1936—.
- Psychotechnische Zeitschrift. (See *Zeitschrift f. Arbeit psychologie.*)
242. Psyke; tidskrift för psykologisk forskning. Stockholm. 1-15, 1906-1920|| (United with *Svenskt archiv för pedagogik* to form *Arkiv för psykologi och pedagogik.*)
243. Quarterly journal of child behavior. New York. 1, 1949—. (PA)

244. Quarterly journal of experimental psychology. Cambridge, Eng. 1, 1948—. (PA)
245. Rassenkunde und psychologische Anthropologie. Leipzig. 1-2, 1936-1938||? (Also numbered as Zeitschrift für angewandte Psychologie, Beihefte, no. 71, 75.)
246. Religionspsychologie. Gütersloh. 1, 1929—. (Suppl. to Zeitschrift für Religionspsychologie.)
247. Religionspsychologie. Vienna. 1-4, 1926-1928|| (Superseded by Religionspsychologie. Gütersloh.)
248. Religionspsychologische Reihe. Gütersloh. 1-2, 1930-1931||?
249. Repertorium der Psychologie und Physiologie nach ihrem Umfange und ihrer Verbindung. Hof. no. 1-2, 1786-1788|| (B)
Repertorium und Bibliothek für empirische Psychologie. (See Allgemeines Repertorium für empirische Psychologie und verwandte Wissenschaften.)
250. Revista de psicologia general y aplicada. Madrid. 1, 1946—.
251. Revista de psicologia y pedagogia. (Barcelona. Universitat. Seminaria de pedagogia.) Barcelona. 1-7, 1933-1937||?
252. Revista de psicologia y pedagogia aplicadas. Valencia. 1, 1950—. (PA)
253. Revista de psihologie [teoretica și aplicată]. (Cluj Universitatea. Institutul de psihologie experimentală, comparată și aplicată.) Cluj. 1, 1938-(?).
254. Revue de psychiatrie et de psychologie expérimentale. Paris. 1-5, 1890-1895; ns. 1-2, 1896-1897; (s3) 1-18, 1897-1914|| (Title varies.)
255. Revue de psychologie. (Institut de Psychologie de l'Université de Montréal.) Montréal. 1, 1946—. (PA)
256. Revue de psychologie appliquée. Paris. 1, 1950—. (PA)
257. Revue de psychologie concrète. Paris. no. 1-2, F-J1, 1929||
258. Revue de psychologie des peuples. (Institut Havrais de Sociologie Economique et de Psychologie des Peuples.) 1, 1945—. (PA)
259. Revue de psychothérapie de la psychologie appliquée. Paris. 1-43, no. 8, 1886-1934|| (Title varies. Superseded by Paris. Ecole de Psychologie. Bulletin. Suspended 1916-1919.)
260. Revue des sciences psychologiques. Paris. 1, no. 1-4, 1913-1914||
261. Revue des sciences psychologiques illustrée. Paris. 1-5, 1890-1894||? (B)
262. Revue psychologique. Brussels. 1-7, no. 2, 1908-1914||
Revue suisse de psychologie et de psychologie appliquée. (See Schweizerische Zeitschrift für Psychologie und ihre Anwendungen.)
263. Rivista di psicologia normale e patologica. (Società Italiana di Psicologia.) Bologna. 1, 1905—. (1-3, 1905-1907 as Rivista di psicologia applicata alla pedagogia ed alla psicopatologia; 4-28, 1908-1932, Rivista di psicologia. Index 1-32, 1905-1936.)
264. Rochester (N.Y.). University.
—Eastman School of Music.
—Studies in psychology. 1, no. 4, 1929|| (v. 1, no. 1-3 never published.)
265. Rome. Università.
—Istituto di psicologia sperimentale.

- Contributi psicologici, 1-6, 1902-1929/1933||? (1-3 published by Laboratorio di psicologia sperimentale.)
 Rorschach research exchange. (See Journal of projective techniques.)
266. Rorschachiana. International review of Rorschach and other projective techniques. 1-?, 1945-1951; 1, 1952—. (PA)
267. Sammlung von Abhandlungen aus dem Gebiete der pädagogischen Psychologie und Physiologie. Berlin. 1-8, no. 7, 1897-1906||
268. Sammlung von Abhandlungen zur psychologischen Pädagogik aus dem "Archiv für die gesamte Psychologie." Leipzig. 1-4, no. 1, 1904-1914||?
269. Scandinavian scientific review; contributions to philosophy, psychology and the science of education by northern scientists. Oslo. 1-3, no. 4, 1922-1924||
270. Schriften zur Wirtschaftspsychologie und zur Arbeitswissenschaft. Leipzig. No. 1-47, 1918-1933|| (1-44 as Schriften zur Psychologie der Berufseignung und des Wirtschaftslebens. Index 1-32; 33-47 in Zeit. f. angew. Psychol.)
271. Schriften zur Psychologie der Strafrechtspflege. Mannheim. 1-3, 1928-1930||
272. Schriften zur Psychologie und Soziologie von Sexualität und Verbrechen. Stuttgart. 1-3, 1928-1932||
273. Schweizerische Zeitschrift für Psychologie und ihre Anwendungen. Bern. 1, 1942—. (French title: Revue suisse de psychologie et de psychologie appliquée.)
 —Beiheft. 1, 1948—.
274. Smith College. Northampton, Mass.
 —William Allan Neilson Research Laboratory.
 —Smith College studies in psychology. 1-4, 1930-1933||
 Sociatry; journal of group and intergroup therapy. (See Group psychotherapy.)
275. Sociedad de psicología. Buenos Aires.
 —Anales. 1, 1933-1935-(?). (Supersedes Boletín.)
 —Boletín. 1-, -1930/1932||
276. Societatea română de cercetări psihologice, Bucharest.
 —Analele de psihologie. 1, 1934-(?).
277. Société Alfred Binet (psychologie de l'enfant et pédagogie expérimentale). Paris.
 —Bulletin mensuel. 1, 1899—. (1899-1917 as Société Libre pour l'Étude Psychologique de l'Enfant. 1-12, no. 3, 1899-1911 as the Society's Bulletin.)
278. Société de psychologie physiologique. Paris.
 —Bulletin. 1-7, 1885-1891||
279. Société Lorraine de Psychologie Appliquée. Nancy.
 —Bulletin. 1, 1913—.
280. Society for the Psychological Study of Social Issues.
 —Bulletin. Chicago. 1-3, no. 1, 1936-1938; 1939-1944||
281. Sociometry; a journal of interpersonal relations. Beacon, N.Y. 1, 1937—.
282. Sovetskaia psikhotehnika. (Vsesoiuznoe obshchestvo psikhotehniki i prikladnoi psikhofiziologii). Moscow. 1-7, no. 4, 1928-1934|| (1, 1928

- as Zhurnal psikhologii, pedagogii i psikhotehniki, sB: Psikhologifiziologia truda i psikhotehnika; 2-4 Psikhotehnika i psikhofiziologiia truda.)
283. Sozialpsychologische Forschungen. (Karlsruhe, Technische Hochschule, Institut für Sozialpsychologie.) 1-2, 1922||?
284. Stanford University.
—Publications. University Series.
—Education, psychology. 1, 1933/1935—.
285. Studien zur Psychologie des Denkens. Leipzig. 1, 1913||?
286. Studies in linguistic psychology. Decatur, Ill. 1, no. 1-2, March-June, 1912|| (Also called James Millikin University, Bulletin. Linguistic psychology series.)
287. Sun Yat-sen University. Canton. Institute of Educational Research.
—Psychological laboratory.
—Studies.
—sA. 1-3, 1932-1934||?
288. Sydney (Australia) University.
—University reprints.
—s12: Social sciences, economics, education, history, philosophy and psychology. 1, 1924—.
289. Tashkent, Universitet. Sredne-aziatskii gosudarstvennyi universitet. (Turkестanskii gosudarstvennyi universitet. University of Central Asia.)
—Trudy. Series lc. Psikhologiia. 1-2, 1929-1930||?
290. TAT Newsletter. Topeka, Kan. 1, 1946—. (PA)
291. Theoria; tidskrift för filosofi och psykologi. Göteborg. 1, 1935—.
292. Tidskrift för psykologi och pedagogik. Göteborg. 1, 1942—. (PA)
293. Tohoku psychologica folia. (Tohoku teikoku daigaku.) Sendai, 1, 1933—.
294. Toronto. University.
—Studies.
—Psychology series. No. 1, 1898—. (No. 1-4 as Psychological Series.)
295. Training School Bulletin. Vineland, N.J. 1, 1904—.
296. Training School. Vineland, N.J.
—Dept. of Research. Publications. No. 1-25, 1914-1922|| (Later issues unnumbered.)
297. Travail humain. Paris. 1, 1933—.
—Publications. sA. 1, 1933—.
—Publications. sB. No. 1, 1936—.
298. Understanding the child. Boston. 1, 1931—. (Suspended Nov. 1935-Mar. 1937)
299. Universal psychology review. Chicago. 1-4, no. 4, 1920-1923||
300. Untersuchungen zur Psychologie, Philosophie und Pädagogik. Göttingen; Leipzig. 1, 1910-(?). (Title varies. v. 2, no. 3, and 6, no. 34 never published; v. 7, 1928— as ns)
301. Utrecht Rijksuniversiteit.
—Psychologisch laboratorium.
—Mededeelingen. 1-7, 1924-1933||
302. Verein für Kinderpsychologie zu Berlin.
—Vorträge. 1-4, 1900-1905||?

303. Vergleichende Untersuchungen zur Psychologie, Typologie und Pädagogik des ästhetischen Erlebens. Göttingen. 1-4, 1927||?
304. Viestnik psikhologii, kriminal'noi, antropologii i pedagogii. (Psikhonevrologicheskii Institut.) Petrograd. 1-8, 1904-1912||?
305. Voprosy filosofii i psikhologii (Moskovskoe psikhologicheskoe obshchestvo.) Moscow. 1-28, no. 5 (no. 1-140), 1889-1917|| (Index 1899-1909 in v. 20, no. 100)
306. Voprosy geneticheskoi refleksologii i pedagogii mladenchestva. Moscow. 1, 1929||?
307. Voprosy teorii i psikhologii tvorchestva. Kharkov. 1-7, 1911-1916||?
308. Warsaw. Universitet.
—Psikhologicheskaja laboratorija.
—Raboty. 1870-1882||?
309. Wiener Arbeiten zur pädagogischen Psychologie. 1-10, 1924-1933|| (v. 8-10 as Schulbriefestet.)
310. Wiener Zeitschrift für Philosophie, Psychologie, Pädagogik. Vienna. 1, 1947—. (PA)
311. Wiener Zeitschrift für Praktische Psychologie. Vienna. 1, 1949—. (PA)
312. West Virginia. State College. Institute.
—Dept. of psychology and philosophy.
—Bulletin. [3, 1936]
—Contributions. no. 1, 1940—.
313. Wissenschaftliche Beiträge zur Pädagogik und Psychologie. Leipzig. 1-5, 1913-1915||
314. Wyoming. University. Laramie.
—Department of psychology.
—Bulletin. 1-3, 1910-1919||
315. Yale University. New Haven.
—Laboratories of comparative psychobiology.
—Contributions. 1, 1925/1927—.
—Psychological laboratory.
—Studies. 1-10, 1892-1902|| Continued as Yale psychological studies. Lancaster, Pa., ns. 1-2, no. 2, 1905-1917|| (Published in Psychological monographs.)
316. Yiddish Scientific Institute. Psychologish-pedagogische sekcyie.
—Shriften far psichologye un pedagogik. Vilna. No. 1, 1933||
317. Zagreb. Univerzitet.
—Psiholoski institut.
—Acta. 1-2, no. 4, 1936?-1937||?
318. Zeitschrift für angewandte Psychologie und Charakterkunde. (Institut für angewandte Psychologie, Leipzig.) Leipzig. 1, 1907- (66, 1944)||?
(Supersedes Beiträge zur Psychologie der Aussage. 1-11 as Zeit. f. angew. Psychol. u. psychologische Sammelforschung; 12-47 as Zeit. f. angew. Psychol. Index 1-10 in 10, 11-25 in 25, 26-50 in 50.)
—Beiheft. 1-92, 1911-1943||
319. Zeitschrift für Arbeitspsychologie und praktische Psychologie. Munich. 1, 1925/1926- (12, 1939)||? (1-10, no. 5/6, 1925-1936 as Psychotechnische Zeitschrift.)

320. Zeitschrift für pädagogische Psychologie und Jugendkunde. Berlin; Leipzig. 1, 1899— (44, no. 5, 1943)||? (1–11, 1899–1910 as Zeit. f. pädagog. Psychol., Pathol. u. Hygiene; 12–25, 1911–1924 as Zeit. f. pädagog. Psychol. u. exper. Pädag. u. Jugendk. Continues after 1910 Zeit. f. exper. Pädag. Index 1–25, 1899–1924.)
321. Zeitschrift für Psychologie und Physiologie der Sinnesorgane. (Deutsche Gesellschaft für Psychologie.) Hamburg; Leipzig. 1–40, 1890–1906|| Continues in two parts: (1) Zeitschrift für Psychologie. 41, 1906–(150, 1941)||? (2) Zeitschrift für Sinnesphysiologie. 41, 1907–(69, 1941)||? (Index: 1–25, 26–50, 51–75, 76–100, 101–125, 126–150.)
—Ergänzungsband. 1–25, 1900–1936||?
322. Zeitschrift für Psychotherapie und medicinische Psychologie. 1, 1951—. (PA)
323. Zeitschrift für Religions-psychologie; Grenzfragen der Theologie und Medizin. Halle a.S.; Leipzig. 1–6, 1907–1913||
324. Zeitschrift für Religionspsychologie. Beiträge zur religiösen Seelenforschung und Seelenführung. (Veröffentlichungen der Internationalen religions-psychologischen Gesellschaft.) Gutersloh. 1–11, no. 3/4, 1928–1938||
325. Zeitschrift für Tierpsychologie. (Deutsche Gesellschaft für Tierpsychologie.) Berlin. 1, 1937— (5, 1944)||?
326. Zeitschrift für Völkerpsychologie und Soziologie. Leipzig. 1–7, 1925–1931|| (Continued as Sociologus to v. 9, no. 4, 1933||)
327. Zeitschrift für Völkerpsychologie und Sprachwissenschaft. Berlin. 1–20, 1860–1890|| (Index 1–20 in 20. Continued as Verein für Volkskunde, Zeitschrift.)
328. Zentralblatt für Psychologie und psychologische Pädagogik. Würzburg. 1–2, 1914–1917||
329. Zhurnal psikhologii, nevrologii i psikiatrii. Moscow. 1–4, 1922–1924||? Zhurnal psikhologii, pedagogii i psikhotekhniki. (See Psikhologiya and also Sovetskaya psikhotekhnika.)
330. Zur Psychologie unserer Zeit. Berlin. 1–5, 1903||?
331. Zurich. Universität.
—Psychologisches Institut.
—Veröffentlichungen. no. 1–11, 1920–1931||

APPENDIX C

Sources for Books, Tests, Apparatus, Equipment, and Supplies

BOOKS

Publishers of Books in Psychology

This list was determined by tabulation of publishers of books in the *Harvard List of Books in Psychology* (A 111). Each publisher with five or more books listed has been included. A few additions have been made in those cases where recent books seem to justify them. Following the name and address of the publisher, the correct citation form for the publisher entry is given.

1. Addison-Wesley Press, Inc., 500 Kendall Sq. Bldg., Cambridge 42, Mass.
Cambridge, Mass.: Addison-Wesley,
2. George Allen & Unwin, Ltd., 40 Museum St., London, WC 1, England.
London: Allen & Unwin,
3. American Book Company, 55 Fifth Ave., New York 3, N.Y.
New York: American Book,
4. Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, N.Y.
New York: Appleton-Century-Crofts,
5. Cambridge University Press, 32 E. 57th St., New York 22, N.Y.
New York: Cambridge Univ. Press,
6. Clark University Press, 950 Main St., Worcester 10, Mass.
Worcester, Mass.: Clark Univ. Press,
7. Columbia University Press, 2960 Broadway, New York 27, N.Y.
New York: Columbia Univ. Press,
8. Thomas Y. Crowell Co., 432 Fourth Ave., New York 16, N.Y.
New York: Crowell,
9. The Dryden Press, 31 W. 54th St., New York 19, N.Y.
New York: Dryden,
10. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, N.Y.
New York: Grune,
11. Harcourt, Brace & Company, Inc., 383 Madison Ave., New York 17, N.Y.
New York: Harcourt,

12. Harper and Brothers, Publishers, 49 E. 33rd St., New York 16, N.Y.
New York: Harper,
13. Harvard University Press, Cambridge 38, Mass.
Cambridge, Mass.: Harvard Univ. Press,
14. D. C. Heath and Co., 285 Columbus Ave., Boston 16, Mass.
Boston: Heath,
15. Paul B. Hoeber, 49 E. 33rd St., New York 16, N.Y.
New York: Hoeber,
16. Henry Holt & Co., Inc., 257 Fourth Ave., New York 10, N.Y.
New York: Holt,
17. Houghton Mifflin Co., 2 Park St., Boston 7, Mass.
Boston: Houghton Mifflin,
18. International Universities Press, 227 W. 13th St., New York 11, N.Y.
New York: Int. Univs. Press,
19. Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N.Y.
New York: Knopf,
20. Longmans, Green & Co., 55 Fifth Ave., New York 3, N.Y.
New York: Longmans,
21. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N.Y.
New York: McGraw-Hill,
22. The Macmillan Co., 60 Fifth Ave., New York 11, N.Y.
New York: Macmillan,
23. W. W. Norton & Co., Inc., 101 Fifth Ave., New York 3, N.Y.
New York: Norton,
24. Odyssey Press, Inc., 101 Fifth Ave., New York 3, N.Y.
New York: Odyssey,
25. Oxford University Press, 114 Fifth Ave., New York 11, N.Y.
New York: Oxford Univ. Press,
26. Kegan Paul, Trench, Trubner & Co., Ltd., 43 Great Russell St., London,
WC 1, England.
London: Kegan Paul,
27. Philosophical Library, Inc., 15 E. 40th St., New York 16, N.Y.
New York: Philos. Lib.,
28. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N.Y.
New York: Prentice-Hall,
29. Princeton University Press, Princeton, N.J.
Princeton, N.J.: Princeton Univ. Press,
30. Rinehart & Co., Inc., 232 Madison Ave., New York 16, N.Y.
New York: Rinehart,
31. The Ronald Press Co., 15 E. 26th St., New York 10, N.Y.
New York: Ronald,
32. W. B. Saunders Co., West Washington Square, Philadelphia 5, Penna.
Philadelphia: Saunders,
33. Scott, Foresman and Co., 433 E. Erie St., Chicago 11, Ill.
Chicago: Scott, Foresman,
34. Charles Scribner's Sons, 597 Fifth Ave., New York 17, N.Y.
New York: Scribner,

35. Charles C. Thomas, Springfield, Ill.
Springfield, Ill.: Thomas,
36. The University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill.
Chicago: Univ. Chicago Press,
37. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N.Y.
New York: Van Nostrand,
38. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y.
New York: Wiley,
39. The Williams & Wilkins Co., Mt. Royal & Guilford Aves., Baltimore 2, Md.
Baltimore, Md.: Williams & Wilkins,
40. Yale University Press, New Haven, Conn.
New Haven, Conn.: Yale Univ. Press,

See also lists of publishers and addresses in *Index to the Publishers' Trade List Annual* (A 3) or the *Cumulative Book Index* (A 1).

Book Dealers

This list includes those dealers who are known to publish special lists of titles in psychology or who offer special services of interest to psychologists.

41. The Book Find Club, 215 Fourth Ave., New York 3, N.Y.
42. Robert Brunner, 1212 Avenue of the Americas, New York 19, N.Y.
43. M. W. Drexler Book Co., 138 W. 67th St., New York 23, N.Y.
44. Edwards Bros., Ann Arbor, Mich. Lithoprint reprints.
45. Haskell, Ltd., 84 University Place, New York 3, N.Y.
46. Key Book Service, 45 Fourth Ave., New York 3, N.Y.
47. Lange, Maxwell & Springer, Inc., 122 E. 55th St., New York 22, N.Y.
48. Wilcox & Follett Co., 1255 S. Wabash Ave., Chicago 5, Ill.

TESTS

This list includes all known U.S. publishers and distributors of psychological tests who issue catalogues or lists of their offerings. No attempt has been made to cover exhaustively the many sources where only a single test is published, although a few such publishers are included if the test in question is widely used.

49. Acorn Publishing Co., Inc., Rockville Centre, N.Y.
50. American Council on Education, 744 Jackson Place, Washington 6, D.C.
51. Aptitude Associates, Merrifield, Va.
52. Bureau of Educational Measurements, Kansas State Teachers College, Emporia, Kans.
53. Bureau of Educational Research, University of Iowa, Iowa City, Iowa.
54. Bureau of Publications, Ohio State University, Columbus, Ohio.
55. Bureau of Publications, Teachers College, Columbia University, New York 27, N.Y.

56. California Test Bureau, 5916 Hollywood Blvd., Hollywood 28, Calif.
57. Center for Psychological Services, George Washington University, Washington 6, D.C.
58. Committee on Diagnostic Reading Tests, Kingscote Apt. 3G, 419 W. 119th, New York 27, N.Y.
59. Division of Educational Reference, Purdue University, Lafayette, Ind.
60. Educational Records Bureau, 437 W. 59th St., New York 19, N.Y.
61. Educational Test Bureau, 720 Washington Ave. SE, Minneapolis 14, Minn.
62. Educational Testing Service, 20 Nassau St., Princeton, N.Y.
63. Family Life Publications, Inc., Box 337, Durham, N.C.
64. The C. A. Gregory Company, 345 Calhoun Street, Cincinnati 19, Ohio.
65. E. M. Hale & Co., Eau Claire, Wisc.
66. Houghton Mifflin Co., 2 Park St., Boston, Mass.
67. Institute for Personality and Ability Testing, 313 W. Avondale St., Champaign, Ill.
68. McKnight & McKnight, 109-11 W. Market St., Bloomington, Ill.
69. National Office Management Association, 2118 Lincoln-Liberty Bldg., Philadelphia 7, Penna.
70. Psychological Corporation, 522 Fifth Ave., New York 18, N.Y.
71. Public School Publishing Co., 509-13 North East St., Bloomington, Ill.
72. Science Research Associates, 228 S. Wabash Ave., Chicago 4, Ill.
73. Sheridan Supply Company, P.O. Box 837, Beverly Hills, Calif.
74. Stanford University Press, Stanford, Calif.
75. Steck Co., 9th at Lavaca, Austin, Texas.
76. C. H. Stoelting Co., 424 N. Homan Ave., Chicago 24, Ill.
77. Syracuse University Press, Syracuse, N.Y.
78. University of Minnesota Press, Minneapolis 14, Minn.
79. U.S. Armed Forces Institute, Madison 3, Wis.
80. U.S. Employment Service, Washington, D.C.
81. Western Psychological Services, Box 775, Beverly Hills, Calif.
82. World Book Company, 313 Park Hill Ave., Yonkers 5, N.Y.

See also information on sources given by Buros (A 230) and the lists of new tests and their publishers appearing annually in the journal *Educational and Psychological Measurements*.

APPARATUS, EQUIPMENT, AND SUPPLIES

This list has been compiled from several sources—advertisements, catalogues, exhibits, and a list prepared in 1950 by a committee of psychologists. We wish to acknowledge with thanks the permission granted by the chairman, Wilbert S. Ray, for the use of their list. The information given here is believed to be correct as of December 1952. Verification was made by direct mail inquiry in those cases where 1952 catalogues or advertisements were unavailable. In the selection of items, emphasis has been given to those firms less likely to be represented in the files of a

university purchasing department. Selection and classification has been done for what we believe to be the greatest usefulness to psychologists. Since a complete anticipation of all psychologists' professional needs in these areas is impracticable if not impossible, this list is not exhaustive, but rather should be used as a basic list. For items of firms whose names are preceded by an asterisk (*), the user should consult local agents or distributors.

General Laboratory Apparatus

83. James G. Biddle Co., 1316 Arch St., Philadelphia 7, Penna.
84. Central Scientific Co., 1700 Irving Park Road, Chicago 13, Ill.
85. Chicago Apparatus Co., 1735 North Ashland Ave., Chicago, Ill.
86. Eberbach & Sons, Inc., Ann Arbor, Mich.
87. A. J. Griner Co., 1827 McGee St., Kansas City 8, Mo.
88. Harvard Apparatus Co., Dover, Mass.
89. Meed Scientific Apparatus Co., P.O. Box 658, Springfield, Mass.
90. Phipps and Bird, Inc., 303 S. Sixth St., Richmond 5, Va.
91. W. M. Welch Scientific Co., 1515 Sedgwick St., Chicago 10, Ill.

Photographic Supplies and Equipment

92. American Photocopy Equipment Co., 2849 N. Clark St., Chicago, Ill. Photo duplicating devices and supplies.
93. Ansco, Binghamton, N.Y. General photographic materials and equipment.
94. * Eastman Kodak Co., Rochester, N.Y. Wide variety of specialized scientific and industrial photo supplies and equipment in addition to materials for amateur photography.
95. F. G. Ludwig Associates, 350 High St., Deep River, Conn. "Contoura"—portable reflex photocopy device.
96. University Microfilms, Ann Arbor, Mich. Microfilming services.

See also annual May issue of *Photography* magazine. Contains a trade directory of equipment and supplies, with specifications.

Components for Apparatus Construction

97. Bodine Electric Co., 2258 W. Ohio St., Chicago, Ill. Fractional horsepower motors.
98. * Boston Gear Works, 106 Brookline Ave., Boston, Mass. Small gears.
99. Electric Indicator Co., Camp Ave., Springdale, Conn. Subfractional (miniature) motors.
100. * General Electric Supply Corp., 200 W. River Ave., Pittsburgh 12, Penna. Fractional horsepower motors.
101. Hagen Manufacturing Co., Inc., Moline, Ill. Synchronous motors.
102. Howard Industries, Inc., Racine, Wisc. Fractional horsepower motors.
103. Relay Sales, 833 W. Chicago Ave., Chicago 22, Ill. Relays, timers, and control devices.
104. Telechron Dept., General Electric Co., 602 Homer Ave., Ashland, Mass. Synchronous timing motors.

- 105. Tyni Switch Division, The Sessions Clock Co., Forestville, Conn. Miniature snap switches.
- 106. Veeder-Root, Inc., 20 Sargent St., Hartford, Conn. Veeder counters.

General Psychological Apparatus

- 107. Fred L. Blendinger, 216 Swann Rd., S.E., Washington 23, D.C.
- 108. N. H. Caskin, 122 E. Sixth St., Williamstown, W. Va.
- 109. Garrison Co., Box 122, Dexter, Mich.
- 110. Ralph Gerbrands, 96 Ronald Rd., Arlington 74, Mass.
- 111. Lafayette Instrument Co., 26 N. 26th St., Lafayette, Ind.
- 112. Marietta Apparatus Co., Marietta, Ohio.
- 113. R. Patterson, 1937 Washington Ave., Wilmette, Ill.
- 114. C. H. Stoelting Co., 424 N. Homan Ave., Chicago 24, Ill.
- 115. Wichita Apparatus Supply, 3026 Stadium Drive, Wichita, Kansas.

Small Laboratory Animals

- 116. Albino Farms, Red Bank, N.J.
- 117. Blue Spruce Farms, RD 2, Altamont, N.Y.
- 118. Breeding and Laboratory Institute, 619 Kent Ave., Brooklyn 11, N.Y.
- 119. Budd Mt. Rodent Farm, Chester, N.J.
- 120. Carworth Farms, New City, N.J.
- 121. John C. Landis, Hagerstown, Md.
- 122. Manor Farms, Staatsburg, N.Y.
- 123. Rockland Farms, New City, Rockland County, N.Y.
- 124. Sprague-Dawley, Inc., Box 2071, Madison 5, Wisc.
- 125. Taconic Farms, Germantown, N.Y.

Animal Laboratory Equipment, Supplies, and Apparatus

- 126. Bussey Products Co., 6000 W. 51st St., Chicago 38, Ill. Small animal laboratory cages.
- 127. Hoeltge Bros., Inc., 1919 Gast St., Cincinnati 4, Ohio. Animal cages and accessory equipment.
- 128. Lloyd Engineering Co., 55 Stephen St., Belleville 9, N.J. Skinner boxes manufactured to order.
- 129. P. J. Noyer Co., Lancaster, N.H. Animal food pellets.
- 130. *Ralston Purina Co., St. Louis 2, Mo. Purina laboratory chow.
- 131. G. S. Stoddard, Inc., 121 E. 24th St., New York, N.Y. Animal food pellets.
- 132. G. H. Wahmann Mfg. Co., 1123 E. Baltimore St., Baltimore 2, Md. Animal experimentation devices, cages, and maintenance equipment.

Audio Equipment

- 133. Audio Development Co., 2833 13th Ave. S., Minneapolis 7, Minn. Audiometers.
- 134. Conn Band Instrument Co., Elkhart, Ind. "Strobocorn" frequency measuring device.
- 135. General Radio Co., 275 Mass. Ave., Cambridge 39, Mass.

- 136. Graybar Electric Co., 420 Lexington Ave., New York 17, N.Y. Audiometer.
- 137. Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.
- 138. Maico Co., Inc., 21 N. Third St., Minneapolis 1, Minn. Audiometers and psychogalvanometers.
- 139. Measurements Corp., Boonton, N.J. Pulse generators, oscillators.
- 140. Nuclear Instrument and Chemical Corp., 223-233 W. Erie St., Chicago 10, Ill. Pulse generators and impulse counters.
- 141. Panoramic Radio Products, Inc., 8 S. Second Ave., Mount Vernon, N.Y. Audio wave analyzer.

See also annual "Buyer's Guide" in mid-June issue of *Electronics* magazine.

Sound Recording Devices

Among the many devices for sound recording on the market there are a wide range of prices and several types of systems to choose from. The prospective purchaser should consult a technician capable of evaluating available units against his particular needs. The few listed here are good representative examples of the different types, but are not necessarily suitable for every use.

- 142. Daystrom Electric Corp., 837 Main St., Poughkeepsie, N.Y. "Daystrom" 110-volt portable recorder with sound embossed in grooves along 35-mm plastic tape band.
- 143. Gray Manufacturing Co., Audograph Division, Hartford 1, Conn. "Audograph"—sound on plastic discs.
- 144. Miles Reproducer Co., Inc., 812 Broadway, New York 3, N.Y. "Walkie-Recordall"—battery portable recorder with sound in grooves on 35-mm film belts.
- 145. Webster-Chicago, 5610 Bloomingdale Ave., Chicago 39, Ill. Sound on magnetic wire.
- 146. Webster Electric Co., Racine, Wisc. "Ekotape"—sound on magnetic tape.
- 147. The Wilcox-Gay Corp., Charlotte, Mich. "Recordio"—sound on standard 78-rpm discs.

See also annual "Buyer's Guide" in mid-June issue of *Electronics* magazine.

Visual Equipment

- 148. American Optical Co., Scientific Instrument Division, Buffalo 15, N.Y. Microscopes, slide projectors, "ophthalmograph"—eye movement camera.
- 149. Bausch & Lomb Optical Co., 78112 St. Paul St., Rochester 2, N.Y. Microscopes, balopticons, "orthorater"—eye test device.
- 150. Corning Glass Works, Corning, N.Y. Optical filters.
- 151. * Eastman Kodak Co., Rochester, N.Y. Wratten filters, variable density wedges.
- 152. Edmund Scientific Corp., 101 E. Gloucester Pike, Barrington, N.J. Lenses, optical instruments.

153. A. Jaegers, 691A W. Merrick Rd., Lynbrook, N.Y. Optical parts.
154. Keystone View Co., Meadville, Penna. "Telebinocular"—eye test device, reading trainer, projectors, stereoscopes.
155. Leeds and Northrup Co., 4908 Stenton Ave., Philadelphia 44, Penna. Macbeth illuminometer; various resistance components and devices.
156. Munsell Color Co., Inc., 10 E. Franklin St., Baltimore 2, Md. Psychophysically calibrated colored papers; Farnsworth-Munsell test of color discrimination; consulting services.
157. The Perkin-Elmer Corp., 840 Main Avenue, Norwalk, Conn. Electro-optical instrumentation.
158. Polaroid Corp., Cambridge 39, Mass. Filters.

Audiovisual Aids

159. Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill. Motion picture and still projectors; sound recorders.
160. The Anatomical Chart Co., 5728 Blackstone Ave., Chicago 37, Ill.
161. Bell and Howell, 7100 McCormick Rd., Chicago 46, Ill. Motion picture equipment.
162. Charles Beseler Co., 60 Badger Ave., Newark 8, N.J. Slide and opaque projection equipment.
163. Clay-Adams Co., Inc., 141 E. 25th St., New York 10, N.Y. Anatomical models, "Medichrome" slides.
164. DaLite Screen Co., 2711 N. Pulaski Rd., Chicago 39, Ill. Projection screens.
165. Denoyer-Geppert Co., 5235 Ravenswood Ave., Chicago 40, Ill. Anatomical models.
166. Dunningcolor Corp., 932 N. LaBrea Ave., Hollywood 38, Calif. "Animatic" 16-mm strip film projector.
167. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N.Y. Instructional films.
168. Psychological Cinema Register, Audio Visual Aids Library, The Pennsylvania State College, State College, Penna. Rental and sale of psychological films.
169. Sound Seminars, 2355 Beechmont Ave., Cincinnati 30, Ohio. "Recorded lectures and discussions of the most eminent authorities in the field [of psychology]."
170. Trans Lux Corp., 1270 S. Sixth Ave., New York, N.Y. Rear projection screens.

See also C 94, C 148, C 149, C 154 for projectors; annual trade directory (May) issue of *Photography* magazine; trade directory each month in *Educational Screen*. Consult local dealers.

Graphic Recording Apparatus

171. Associated Research Inc., 3758 W. Belmont Ave., Chicago, Ill. Keeler polygraph.
172. Brush Electronics Co., 3405 Perkins Ave., Cleveland 14, Ohio. Magnetic recording oscillographs, amplifiers, sound recorders, piezo-electric materials.

173. Esterline-Angus Co., Inc., P.O. Box 596, Indianapolis 6, Ind. Graphic recording instruments including operation recorders.
174. Gorrell & Gorrell, Haworth, N.J. Kymographs.
175. Heiland Research Corp., 130 E. Fifth Ave., Denver 9, Colo. Photo-oscillograph recorders.
176. National Aniline Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y. Dyes for making recording ink.
177. Stylograph Corporation, 205 W. Main St., Rochester 4, N.Y. Waxed recording paper.
178. Arthur H. Thomas Co., West Washington Square, Philadelphia 5, Penna. Kymographs.

See also *C 90, C 94, C 111, C 114, C 194, C 197.*

Timing and Counting Devices

179. American Chronoscope Corp., 316 W. First St., Mount Vernon, N.Y. Timing devices.
180. Amglo Corp., 2037 W. Division St., Chicago 22, Ill. Timing control equipment.
181. The R. W. Cramer Co., Inc., Box 27, Centerbrook, Conn. Synchronous motors, timing control devices.
182. Cyclotron Specialties, Moraga 5, Calif. High-speed impulse counters.
183. M. Ducommun, 580 Fifth Ave., New York 19, N.Y. Stop watches.
184. Haydon Manufacturing Co., Inc., 500 Elm St., Torrington, Conn. Synchronous timing motors.
185. Hunter Manufacturing Co., Inc., 1164 East Court St., Iowa City, Iowa. Decade interval timer.
186. Industrial Timer Corp., 115 Edison Place, Newark, N.J. Time measuring and time control devices.
187. D. J. Leighton Co., 427 Broadway, New York 13, N.Y. Stop watches and timers.
188. Meylan Stopwatch Co., 264 W. 40th St., New York 18, N.Y.
189. The Standard Electric Time Co., 97 Logan St., Springfield 2, Mass. Precision timers.
190. Timer Division, The Sessions Clock Co., Forestville, Conn. Clock driven timing switches.

See also *C 103, C 140, C 191.*

Electrophysiology

191. American Electronics Laboratories, Inc., 641 Arch St., Philadelphia 6, Penna. Amplifiers for electrophysiology, timers, electronic stimulators.
192. C. J. Applegate & Co., 1816 Grove St., Boulder, Colo. Electronic stimulator.
193. Cambridge Instrument Co., Inc., Grand Central Terminal, New York 17, N.Y. Electrocardiograph and other precision mechanical and electrical instruments.

194. Edin Electronics Co., 207 Main St., Worcester 8, Mass. Electroencephalographs, electrocardiographs, cardi tachometers, psychogalvanometers, graphic recorders, amplifiers for bioelectrics.
195. The Edison Swan Electric Co., Ltd., Radio Division, 155 Charing Cross Rd., London WC 2, England. "Ediswan" electroencephalograph and EEG wave analyzer.
196. The Electrodyne Co., Endicott St., Norwood, Mass. Electronic stimulator, alertness indicators.
197. Electro-Medical Laboratory, Inc., South Woodstock 7, Vt. Garceau electroencephalograph, psychogalvanometer, electronic stimulator, graphic recorder, and related equipment.
198. GME, 4 Franklin Ave., Madison, Wisc. Electroencephalograph.
199. Grass Instrument Co., 101 Old Colony Ave., Quincy, Mass. Electroencephalographs and associated equipment.
200. Marconi Instruments, Ltd., New York Office, 23-25 Beaver St., New York 4, N.Y. Electroencephalographs.
201. Medcraft Electronic Corp., 41-41 24th St., Long Island City 1, N.Y. Electroencephalographs, electromyographs, electronic stimulators.
202. The Meditron Co., 708 S. Fair Oaks Ave., Pasadena 2, Calif. Electromyographs, electronic stimulators.
203. Offner Electronics, Inc., 5320 Kedzie Ave., Chicago 25, Ill. Electroencephalographs, electro-shock apparatus.
204. Phipps and Bird, Inc., 303 S. Sixth St., Richmond 5, Va. Recording cardi tachometer.
205. Sanborn Co., Cambridge 39, Mass. Electrocardiographs, electrophysiology supplies.
206. Waters Conley Co., Rochester, Minn. Cardi tachometer, kymographic recording camera.

See also C 138.

Electric-electronic Components and Assemblies

207. Allied Radio Corp., 833 W. Jackson, Chicago, Ill. Radio and electrical equipment and supplies.
208. Ballentine Laboratories, Inc., Boonton, N.J. Precision electronic voltmeters.
209. James G. Biddle Co., 1316 Arch St., Philadelphia 7, Penna. Tachometers, rheostats, galvanometers, and other instruments.
210. Concord Radio Corp., 55 Vesey St., New York 7, N.Y. Radio and electrical equipment and supplies.
211. Dubin Electronics Co., Inc., 103-02 Northern Blvd., Corona, N.Y. Electronic components and equipment.
212. Allen B. DuMont Laboratories, Inc., 1500 Main Ave., Clifton, N.J. Cathode ray tubes and equipment.
213. G-M Laboratories, 4320 N. Knox Ave., Chicago 41, Ill. Electric instruments.
214. Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill. Relays, solenoids, switches, controls, and other electric-electronic devices.

215. Lambda Electronics Corp., 103-02 Northern Blvd., Corona 68, N.Y. Electrically regulated power supplies.
216. * Minneapolis-Honeywell Regulator Co., Brown Instrument Division, Wayne and Windrim Aves., Philadelphia 44, Penna. "Electric and electronic instruments for the measurement of many different variables."
217. Rubicon Co., Ridge Ave. & 35th St., Philadelphia 32, Penna. Precision resistance apparatus and galvanometers.
218. Sorenson and Co., Inc., 375 Fairfield Ave., Stamford, Conn. Electronic voltage regulators.
219. United Transformer Co., 150 Varick St., New York, N.Y. Transformers.

See also *C 135*, *C 155*, *C 193*; radio parts distributors in most cities; annual "Buyer's Guide" in mid-June issue of *Electronics* magazine.

Miscellaneous

220. Bio-Medical Instrument Co., Chagrin Falls, Ohio. "Bio-thesiometer"—vibration sensitivity measurement.
221. Creative Playthings, Inc., 5 University Place, New York 3, N.Y. Amputee and bendable family dolls and other toys for play therapy.
222. Educational Playthings, A Division of American Crayon Co., Sandusky, Ohio. "Educational work and play materials."
223. Pittsburgh Plate Glass Co., Pittsburgh, Penna. One-way-vision mirror.
224. Reading Trainer, 5811 Riverview Blvd., St. Louis 21, Mo.

APPENDIX D

Glossary of Abbreviations Useful to the Psychologist

This list has been compiled from journals, textbooks, abbreviation dictionaries, psychological dictionaries, and other reference sources. The intent has been to include abbreviations actually in use in the psychological literature rather than to introduce new abbreviations, however useful and pertinent they might be. We have avoided the inclusion of those terms which are abbreviated in a single journal article or a book and which are unique to that particular report. There has been no attempt to include the many symbols used in the interpretation of individual tests, nor those used in statistics. Arrangement is alphabetical within the six categories, which have been selected for greatest usefulness.

CITATIONS AND REFERENCES

Terms Used in Making References and Citations

anon.	anonymous	illus. (on LC cards)	illustration
auth.	author	illust.	illustrated
cf. (<i>confer</i>)	compare	i. q. (<i>idem quod</i>)	the same as
col. (on LC cards)	colored	loc. cit. (<i>loco citato</i>)	in the place cited
comp.	compiler	ms	manuscript
diagr. (on LC cards)	diagram	N. B. (<i>nota bene</i>)	mark well
ed.	edition, editor	n. d.	no date
et al. (<i>et alibi</i>)	and elsewhere	no. (<i>numero</i>)	number
et al. (<i>et alii</i>)	and others	ns	new series
et seq. (<i>et sequens</i>)	and the following	op. cit. (<i>opere citato</i>)	in the work cited
f., ff.	the following page, pages	P., pp.	page, pages
fig.	figure	port. (on LC cards)	portrait
f. v. (<i>folio verso</i>)	on the back of the page	q. v. (<i>quod vide</i>)	which see
ibid. (<i>ibidem</i>)	the same	ref.	reference
		rev.	revised

ser.	series	v. (<i>vide</i>)	see
sic	thus (or just as given)	v. (on LC cards)	volume
		vol.	volume
t. p. (on LC cards)	title page	v. s. (<i>vide supra</i>)	see above

Terms Frequently Used in Journal Titles

A few of the terms frequently found in journal titles are never abbreviated. They are also included in the list.

Abh.	Abhandlungen	Biomet.	Biometrics
abnorm.	abnormal	Bull.	Bulletin
Abstr.	Abstract	Bur.	Bureau
Acad.	Academy, Académie, Academia	Casewk	Casework
Accad.	Accademia	Charact.	Character
acoust.	acoustical	Chem.	Chemistry, Chemical
Aesthet.	Aesthetics	Child.	Children
Akad.	Akademie	Childh.	Childhood
allg.	allgemeine, allge- meiner	Coll.	College
Amer.	American	comp.	comparative
An.	Anales	Conf.	Conference
Anat.	Anatomy	Congr.	Congress
angew.	angewandte	consult.	consulting
Ann.	Annals, Annaes, An- nale, Annalen, An- nali	Contr.	Contribution
Annu.	Annual, Annuaire, Annuario	Coun.	Council
Anthrop.	Anthropology, An- thropologie, An- thropologist	C. R.	Comptes-rendus
Anz.	Anzeiger	crim.	criminal, criminelle
appl.	applied, appliqué	Def.	Deficiency
ArbWiss.	Arbeitswissenschaft	Delinqu.	Delinquent, Delin- quency
Arch.	Archives, Archivio, Archivos, Archiv, Archivo	Dep.	Department
Asoc.	Asociación	Develpm.	Development
Ass.	Association	Dig.	Digest
aviat.	aviation	Dis.	Disease
Bd	Board	Disord.	Disorders
Behav.	Behavior	Dtsch.	Deutsche
Beih.	Beihefte	Ecol.	Ecology
Ber.	Bericht	Econ.	Economics
		Educ.	Education
		Emplt	Employment
		Engng	Engineering
		Engr	Engineer
		Ergeb.	Ergebnisse
		Evolut.	Evolution
		except.	exceptional

Exch.	Exchange	ment.	mental
exp.	experimental, experi- mentelle, experi- mentale	Mgmt	Management
		Misc.	Miscellaneous
Fam.	Family	mon.	monthly
Forsch.	Forschung	Monogr.	Monograph
Fortschr.	Fortschritte	Mschr.	Monatsschrift
Found.	Foundation	N.	North
Gegenw.	Gegenwart	nat.	national
gen.	general, generale, général	nerv.	nervous
genet.	genetic	Nervenheilk.	Nervenheilkunde
Geront.	Gerontology	Neurol.	Neurology
ges.	gesamte	Neuropath.	Neuropathology
Ges.	Gesellschaft	Newsltr	Newsletter
Handb.	Handbook, Hand- buch	norm.	normal
Hered.	Heredity	north.	northern
Hlth	Health	Nurs.	Nursing
Hosp.	Hospital	Nutrit.	Nutrition
Hyg.	Hygiene	occup.	occupational
Illum.	Illumination	Opin.	Opinion
Indiv.	Individual	Opt.	Optics
industr.	industrial	Ophthal.	Ophthalmology
Insan.	Insanity	Optom.	Optometry
Inst.	Institute, Institut, In- stitut	Orthopsychiat.	Orthopsychiatry
Instn	Institution	Otol.	Otology
Instrum.	Instrument	Otolaryng.	Otolaryngology
int.	international	Pap.	Papers
intern.	internal	Parapsychol.	Parapsychology
Invest.	Investigation	Path.	Pathology
J.	Journal	Pedag.	Pedagogy
Jb.	Jahrbuch	Pediatr.	Pediatrics
Journ.	Journalism	Pers.	Personality
juv.	juvenile	Personnel	Personnel
Kwart.	Kwartalnik	Phil.	Philosophy
Lab.	Laboratory	Phon.	Phonetics
Math.	Mathematics	phys.	physical
Measmt	Measurement	Physiol.	Physiology
mech.	mechanical	Pr.	Press
Med.	Medicine	Pract.	Practice
med.-leg.	medicolegal	Practit.	Practitioner
Mem.	Memoir	Proc.	Proceedings
		Progr.	Progress
		proj.	projective
		psych.	psychical

Psychiat.	Psychiatry	Soc.	Society
Psychoanal.	Psychoanalysis	Sociol.	Sociology
Psychodr.	Psychodrama	spec.	special
Psychol.	Psychology	Speech	Speech
Psychologist	Psychologist	sper.	sperimentale
Psychometr.	Psychometrics	Statist.	Statistics
Psychopath.	Psychopathology	sth.	southern
psychosom.	psychosomatic	Stud.	Study, Studies, Studien
Psychotech.	Psychotechnics		
Psychother.	Psychotherapy	Supervis.	Supervision
Publ.	Public	Suppl.	Supplement
Public.	Publication	Surv.	Survey
quant.	quantitative	Sympos.	Symposium
quart.	quarterly	Teach.	Teacher
Rec.	Record	tech.	technical
Rehabilit.	Rehabilitation	Theor.	Theory
Relat.	Relations	Ther.	Therapy
Relig.	Religion	Train.	Training
Rep.	Report	Trans.	Transactions
Res.	Research	u.	und
Rev.	Review, Revista, Revue	Univer.	University
		Untersuch.	Untersuchungen
Riv.	Rivista	vergl.	vergleichende
Roy.	Royal	voc.	vocational
S.	South	Welf.	Welfare
Sch.	School	Wiss.	Wissenschaft
Schr.	Schriften	Wkly	Weekly
Sci.	Science	Wschr.	Wochenschrift
sci.	scientific	Wk	Work
Scientist	Scientist	Yearb.	Yearbook
Sect.	Section	Z.	Zeitschrift
Ser.	Series	Zbl.	Zentralblatt
Serv.	Service	Zh.	Zhurnal
soc.	social	Zool.	Zoology

See also A 159 for rules to be followed in abbreviating journal titles.

ORGANIZATIONS

AA	Alcoholics Anonymous
AAA	American Anthropological Association
AAAS	American Association for the Advancement of Science
AAMD	American Association for Mental Deficiency
AAUP	American Association of University Professors
AAUW	American Association of University Women

ABEPP	American Board of Examiners in Professional Psychology
ACE	American Council on Education
ACP	Association of Consulting Psychologists
ACPA	American Catholic Psychological Association
ACPA	American College Personnel Association
ADI	American Documentation Institute
AERA	American Educational Research Association
AFB	Air Force Base
AGO	Adjutant General's Office
AIP	Association Internationale de Psychotechnique
ALA	American Library Association
AMA	American Medical Association
AMRL	Army Medical Research Laboratory
ANA	American Nursing Association
AOA	American Orthopsychiatric Association
APA	American Philosophical Association
APA	American Psychiatric Association
APA	American Psychoanalytic Association
APA	American Psychological Association
ASA	Acoustical Society of America
ASA	American Standards Association
ASA	American Statistical Association
ASAA	American Society of Applied Anthropologists
ASCA	American Speech Correction Association
ASPCA	American Society for the Prevention of Cruelty to Animals
ASS	American Sociological Society
ASTP	Army Specialized Training Program
BPA	British Psychological Association
BuMed	(USN) Bureau of Medicine
BuPers	(USN) Bureau of Personnel
CEEB	College Entrance Examination Board
CGPA	Council of Guidance and Personnel Associations
CID	Central Institute for the Deaf
CPA	Canadian Psychological Association
CSC	Civil Service Commission
EPA	Eastern Psychological Association
ETS	Educational Testing Service
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission
FWA	Federal Works Agency
GPO	(U.S.) Government Printing Office
HRRC	Human Resources Research Center
HRRI	Human Resources Research Institute

HRRL	Human Resources Research Laboratory
HumRRO	Human Resources Research Office
IBM	International Business Machines (Corporation)
ICC or ISCC	Intersociety Color Council
ICEC	International Council for Exceptional Children
ICI	International Commission on Illumination
ICWP	International Council of Women Psychologists
ISGS	International Society of General Semantics
IUSP	International Union of Scientific Psychology
LC	Library of Congress
MCWR	Marine Corps Women's Reserve
MPA	Midwestern Psychological Association
NAS	National Academy of Science
NBS	National Bureau of Standards
NDRC	National Defense Research Committee
NEA	National Education Association
NOMA	National Office Management Association
NORC	National Opinion Research Center
NRC	National Research Council
NRL	Naval Research Laboratory
NSF	National Science Foundation
NSSE	National Society for the Study of Education
NVGA	National Vocational Guidance Association
OCS	Officer Candidate School
ONR	Office of Naval Research
OSA	Optical Society of America
OSRD	Office of Scientific Research and Development
OSS	Office of Strategic Services
OWI	Office of War Information
PCR	Psychological Cinema Register
PRF	Purdue Research Foundation
PsyCorp.	Psychological Corporation
PTA	Parent Teacher Association (The National Congress of Parents and Teachers)
RDB	Research and Development Board
RMBAPA	Rocky Mountain Branch of the American Psychological Association
SAA	Speech Association of America
SAM	(USAF) School of Aviation Medicine
SEP	Society of Experimental Psychologists
SPR	Society for Psychical Research
SPSSI	Society for the Psychological Study of Social Issues
SRA	Science Research Associates

SRCD	Society for Research in Child Development
SSPP	Southern Society for Philosophy and Psychology
SSRC	Social Science Research Council
UNESCO	United Nations Educational Scientific and Cultural Organization
USAF	U.S. Air Force
USAFI	U.S. Armed Forces Institute
USES	U.S. Employment Service
USMC	U.S. Marine Corps
USN	U.S. Navy
USPHS	U.S. Public Health Service
VA	(U.S.) Veterans Administration
WAC	Women's Army Corps
WAF	Women in the Air Force
WAVES	Women Appointed for Volunteer Emergency Service (USN)
WFMH	World Federation for Mental Health
WPA	Western Psychological Association
WPB	War Production Board
YMCA	Young Men's Christian Association
YMCathA	Young Men's Catholic Association
YMHA	Young Men's Hebrew Association
YWCA	Young Women's Christian Association
YWHA	Young Women's Hebrew Association

State psychological associations. Use the standard abbreviation for the state with appropriate initials for the remainder of the title. For example: ColPA, ConnSPA, IllPA, IndPA, KanPA, KyPA, MoPA, MinnPA.

PSYCHOLOGICAL TERMS

A	age or maturity (Tolman)	C-group	control group
AE	average error	cns	central nervous system
AL	adaptation level	CP	Clinical Psychologist
AP	action potential	CR	conditioned response
B	blue	CS	conditioned stimulus
Be.	behavior	CV	controlled variable
Bl	black	D	drive (Hull)
BMR	basal metabolic rate	DI or ΔI	increment of intensity (or stimulus strength)
Bp	blood pressure	Dipl.	Diplomate of ABEPP
BR	Brunswick Ratio (constancy measure)	Div.	Division (of APA)
CCP	Chief Clinical Psychologist	DL	difference limen
CE	constant error	DQ	development quotient
CFF	critical flicker frequency	DR or ΔR	increment of response
		DT	delirium tremens
		DV	dependent variable

E	environment	IU	interval of uncertainty (psychophysics)
E, Es, } Es', E's }	experimenter, experimenters, etc.	IV	independent variable
e	error (psychophysics)	IV	intervening variable
E/C	(intervening variable) by experimental-control difference derivation (Marx)	JND	just noticeable difference
ECG	electrocorticogram	L (used with U or U & M)	lower group
ECT	electro-convulsive therapy	LDR	light-dark ratio (visual flicker)
EEG	electroencephalography, -gram, -graph	L Sp.	Life space (Lewin)
E-group	experimental group	M (used with U and L)	middle group
EKG	electrocardiogram	MAF	minimum audible field
EMG	electromyogram	MAP	minimum audible pressure
EOG	electro-oculogram	MD	manic depressive, mental deficiency
ERG	electroretinogram	N	number (of cases or observations)
ESP	extra-sensory perception	NP	neuropsychiatric
EST	electro-shock therapy	O	observer (and variants as in the case of E)
exp.	experiment	O	orange
F ₁ , F ₂ , etc.	successive generations (genetics)	OT	occupational therapy
FAE	figural after-effects	P	person (Lewin)
FFF	flicker fusion frequency	P	physiological drive conditions (Tolman)
F-G	figure-ground	P or p	probability
G	green	pd	interpupillary distance
GG	goal gradient	PGR	psychogalvanic reflex (see also GSR)
FLYBAR	flying by auditory reference	PI	Proactive inhibition
gp	group	p-n	press-need (Murray)
GSR	galvanic skin response (see also PGR)	pr	pulse rate
H	heredity	PSE	point of subjective equality (psychophysics)
h	measure of precision in psychophysics	ψ	psychology, psychological
HRC	heart rate change	PSW	psychiatric social worker
I/E ratio	inspiration-expiration ratio	PTC	phenylthiocarbamide
I-figure	inspection figure	R	red
I-fraction	ratio of inspiration to inspiration-expiration total	R	response
ind.	individual	RB	reactional biography (Kantor)
i _R	inhibitory potential (Hull)		

RI	retroactive inhibition	SR	stimulus-response (relationship)
Rp	reaction probability (Hull)	S-R	stimulus response (learning theory)
RQ	recovery quotient	S \leftrightarrow R	stimulus-response interaction, or interbehavior (Kantor)
RS	reinforcing stimulus (conditioning)	S-S	sign-significate (learning theory)
RT	reaction time	St.	stimulus
S	environmental-stimulus-condition (Tolman)	T	previous training (Tolman)
S	standard stimulus (psychophysics)	T	transition point (psychophysics)
S	subject (and variants as in the case of E)	T and C	trained and control Ss (co-twin control studies)
s or V	variable stimulus (psychophysics)	TE	time error
Sc	stimulus components (Hull)	TE	trial and error (learning)
Sd	drive stimulus (Hull)	T-figure	test figure
SE	stimulus function evolution (Kantor)	T-M	tests and measures
sER	excitatory potential (Hull)	U (used with L or M & L)	upper group
s \bar{E} R	effective excitatory potential (Hull)	UCR or UR	unconditioned response
s \hat{E} R	momentary effective reaction potential (Hull)	UCS or US	unconditioned stimulus
SF	stimulus function (Kantor)	U-C-S diagram	uniform-chromaticity-scale diagram
sHr	habit strength (Hull)	UCV	uncontrolled variable
sLr	reaction threshold (Hull)	V or s	variable stimulus (psychophysics)
S/N	speech (or signal) to noise ratio	V	violet
SO	stimulus object (Kantor)	VTE	vicarious trial and error
SOR or S-O-R	stimulus-organism-response	W	Weber fraction
sOr	behavioral oscillation (Hull)	W	white
S-P	sensation and perception	Y	yellow
		δ	male
		ϕ	female

TESTS AND TEST INTERPRETATION

ACE	American Council on Education (test)
AGCT	Army General Classification Test
AQ	achievement, or accomplishment, quotient

AUD	Agree, undecided, disagree—type of test item
CA	chronological age
CAVD test	Thorndike test of completion, arithmetic, vocabulary, and directions
CQ	conceptual quotient
CTMM	California Test of Mental Maturity
DAT	Differential Aptitude Test
DOT	Dictionary of Occupational Titles
DQ	(Wechsler-Bellevue) deterioration quotient
DRQ	Discomfort-relief quotient (Dollard-Mowrer)
EQ	educational quotient
GAMIN	Guilford-Martin Inventory (of personality factors)
GATB	General Aptitude Test Battery (of USES)
GPA	Grade-point average
H-K test	Hanfmann-Kasanin Concept Formation Test
HMCR	Harrower Multiple Choice Rorschach
HPR	honor point ratio (academic grades)
H-T-P test	House-Tree-Person Test
IBM	International Business Machine (equipment, answer forms, etc.)
IQ	intelligence quotient
ITED	Iowa Tests of Educational Development
Kent EGY	Kent Emergency Intelligence Scales
LID	Like, indifferent, dislike—test item responses
MA	mental age
MAPS	Make-A-Picture-Story (test)
MAT	Miller Analogies Test
M-C	multiple-choice (test item)
MCAT	Medical College Admission Test
MDI	Mental deterioration index (Wechsler)
Minn. TSE Inventory	Thinking, Social, Emotional (introversion) Inventory
MMPI	Minnesota Multiphasic Personality Inventory
MU	mental units (Heinis)
OAP	occupational aptitude pattern
OCCL	Occupational Characteristics Check List
OSPE	Ohio State Psychological Examination
P-F test	Picture-Frustration test (Rosenzweig)
PMA	Primary Mental Abilities (test) (Thurstone)
PNAvQ	Positive-negative ambivalent quotient (Raimy)
PR or %ile	percentile rank
PVT	Picture Vocabulary Test (Ammons)
RCT	Rorschach Content Test (score) (Elizur)
RI	Reynell Index (a deterioration index for the WB)

SAT	Scholastic Aptitude Test (of CEEB)
SB	Stanford Binet (Intelligence Test)
SET	Symbol Elaboration Test (Krout)
SMCR	Singer Multiple Choice Rorschach
SS	standard score
STDCR	Guilford Inventory of (Personality) Factors
TAI	Teacher Attitude Inventory (Leeds-Callis)
TAT	Thematic Apperception Test
T-F	True-false (test item)
WB	Wechsler Bellevue (Intelligence Scale)
WISC	Wechsler Intelligence Scale for Children
X-O test	Pressey Cross-out Test

See also coding and symbols used for specific test scores, such as in manuals for the MMPI, Rorschach, and others.

PHYSICAL MEASUREMENTS

A	Ångström unit (one ten-thousandth of a micron)	diam.	diameter
		doz.	dozen
ac	alternating current	dv	double vibration
B	luminance (photometric brightness)	E	illuminance (illumination)
BTU	British Thermal Unit	emf	electro-motive force
C or Cent.	Centigrade	F or Fahr.	Fahrenheit
cc	cubic centimeter	F	luminous flux
ccw.	counterclockwise (rotation)	fc.	footcandle
cemf	counter electro-motive force	fpm	feet per minute
		fps	feet per second
cft. or ft. ³	cubic feet	ft. L	foot Lambert
cgm.	centigram	ft. lb.	foot pound
cgs	centimeter-gram-second	g	gram
cm.	centimeter	gal.	gallon
cmm. or mm. ³	cubic millimeter	hr	hour
cmps	centimeter per second	ht	height
cp	candle power	in.	inch
cps	cycles per second	I	Luminous intensity
cw.	clockwise (rotation)	inf.	infinity
d	diopter	ips	inches per second
db.	decibel	L	lumen
dc	direct current	lb.	pound
deg.	degrees of angle	log	logarithm
°	degrees of temperature	m	meter
		mi.	mile
		mg.	milligram

min.	minute	rms	root-mean-square
ml.	millilambert	rpm	revolutions per minute
mm.	millimeter	rps	revolutions per second
mμ.	millimicron	sec.	second
mo.	month	sq.	square
mph	miles per hour	sq. (unit) or (unit) ² , e. g., sq. in. or in. ²	square (unit), e.g., square inches
msec. or σ	millisecond		
mv.	millivolt		
μg.	microgram	v	volt
μμ.	micromicron	v or vol.	volume
μv.	microvolt	wk	week
pr.	pressure	wt.	weight
Q	luminous energy	yd	yard
Q/A	areal density of luminous energy	yr	year

GENERAL AND MISCELLANEOUS

alt.	alternating	couns.	counselor, counseling
amt	amount	CRT	cathode ray tube
ant.	anterior	cyl.	cylinder
approx.	approximate	dept.	department
assn	association	diag.	diagnostic
assoc.	associate	diam.	diameter
asst.	assistant	diff.	difference
bd	board	dir.	director
bibl. or bib.	bibliography	disser.	dissertation
bur.	bureau	dist.	distal
caps.	capital letters (type)	DP	displaced person
chmn	chairman	dpdt	double pole double throw (electric switch)
clin.	clinical, clinic		
co.	company	dpst	double pole single throw (electric switch)
coef.	coefficient		
cog.	cognate	equiv.	equivalent
coll.	college	esp.	especially
comm.	committee, commission	exc.	except, exception
comp.	comparative	freq.	frequency
comp.	compiler	inst.	institute, institution
conf.	conference	instr.	instructor
cong.	congress	internat.	international
consult.	consultant, consulting	interv.	interviewer
cor.	corrected, correlated	invgt.	investigation
Corp.	Corporation	lab.	laboratory
counc.	council		

lang.	language	psych't	psychologist
lc	lower case (type)	qty	quantity
lib.	library	rad.	radius
ment.	mental	res.	research
no.	number	sci.	science, scientific
per.	perimeter	sect.	section
%	per cent	secy	secretary
post.	posterior	sm. c.	small capitals (type)
pres.	president	spec.	special, specified
prof.	professor	sph.	sphere
profes.	professional	std	standard
prox.	proximal	stud.	student
psych.	psychology, psycholog- ical	transl.	translated
psychiat.	psychiatry, psychiatric	uc	upper case (type)
psychoanal.	psychoanalysis	Univ.	University
psychomet.	psychometric, psycho- metrician	VT	vacuum tube

See also: statistics (A 178, A 180); mathematics (A 143); radio circuit symbols (A 175); academic degrees (A 37); medical terms (A 102); and the following dictionaries of general abbreviations:

Allen, Edward F. *Allen's dictionary of abbreviations and symbols*. New York: Coward-McCann, 1946.

Shankle, G. E. *Current abbreviations*. New York: Wilson, 1945.

Stephenson, Herbert John. *Abbrevs; (A dictionary of abbreviations)*. New York: Macmillan, 1945.

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